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June 8th, 1892.

A

PRACTICAL TREATISE

ON THE

DISEASES OF WOMEN.

BY

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SIXTH EDITION,

ENLARGED AND THOROUGHLY REVISED

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THE GYNECOLOGICAL SOCIETY OF BOSTON, MASS.

CONTAINING THREE HUNDRED AND FORTY-SEVEN ENGRAVINGS ON WOOD.

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PREFACE TO SIXTH EDITION.

THAT the fifth edition of this work has been allowed to be its representative for ten years is not due to lack of solicitation that its author should issue a revision, nor yet to his unwillingness to yield to pressure exerted from many directions. Unable to find the opportunity himself, his choice fell on me as most likely to execute a revision in accordance with his own views. While appreciating the compliment, I hesitated to accept for two chief reasons: first, the difficult nature of the task, which would probably equal if not exceed the work of writing an entirely original book of my own; and secondly, the fear that, this being my first venture in the field of revising another man's work, I might find it impossible to subordinate my own views to those held by the author, and thus either clash with him or fail to give proper emphasis to opinions which I did not happen to share. The author very kindly obviated these difficulties by empowering me to change, omit, or add wherever I saw fit, without reference to his views or experience, merely requesting me, when we chanced to differ, to state the fact in the text.

Under these conditions I accepted the task, and have endeavored scrupulously to carry out the terms of the agreement. Individual experiences or differing opinions have been included in brackets and signed T. G. T. or P. F. M. as the case may be. All additions and alterations in this revision were without exception made by me, and I hold myself solely responsible for them.

In the main, I have tried to be conservative and to avoid advocating extreme measures or ideas, which are out of place in a textbook designed for students and general practitioners. I have sought so to revise and remodel it as to bring not only its general arrangement

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but also the details of the individual subjects up to date, embodying as thoroughly as space would allow the advances and improvements made since the publication of the last edition ten years ago. At the same time, I have endeavored to preserve as far as consistent with the purpose the peculiar and distinctive features which have made the work so popular for over a quarter of a century.

The first chapter, entitled "Historical Sketch of Gynecology," was left nearly unaltered, being changed only so as to bring it up to date. All the other chapters have been largely altered, and several entirely rewritten. That on the Perineum I thought best not to change as much as I might have done had I felt able to substitute a more intelligible or practical description of that organ and its lesions for the old one of the author. The chapters on Pelvic Cellulitis and Peritonitis and on Displacements might have been very much condensed, but would not then have shown the changes through which these subjects have passed during the last decade. Several new chapters have been added, such as those on Electricity, Hermaphrodism, Diseases of the Urethra and Bladder, and the Diseases of the Female Breast.

The series of illustrations has undergone a corresponding change. They are mostly new to the book, and at least one-third now appear for the first time. To Messrs. William Wood & Co. I am under obligations for permission to use a number of illustrations from their publications.

I hope I have succeeded in doing justice to the confidence imposed in me by my friend the author, and in producing a revision satisfactory to him and the profession. My critics will, I trust, in passing judgment on this work, take into consideration the difficulties under which a man labors, who after an active experience of his own of twenty-five years as a writer and practitioner in the same specialty, undertakes the task of revising the work of an older teacher and friend.

PAUL F. MUNDÉ.

No. 20 West 45th St., New York,
October, 1891.

FROM THE

PREFACE TO THE FIFTH EDITION.

THE author's object has been to write a practical work, not an encyclopædia; to record views and methods which recommend themselves on account of their merit, not merely of their novelty. So rapidly do new things present themselves in this active department of medicine, however, that it must be stated that some innovations which apparently possess merit have been left unmentioned because sufficient time has not elapsed for their trial.

To the medical profession in America the author would express his sincere thanks for numberless acts of kindness, encouragement, and courtesy, which have stimulated his ambition to improve a work which has met their generous endorsement and lightened the labor which has attended his efforts.

The kindly reception of previous editions of this work in Europe, as evidenced by its translation into German, French, Italian, and Spanish, has given the author sincere gratification, and he avails himself of this opportunity of thanking the translators for the very careful manner in which they have performed their work, and the uniform courtesy which they have shown to him.

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THE

DISEASES OF WOMEN.

CHAPTER I.

HISTORICAL SKETCH OF GYNECOLOGY.

At the present day, when so much attention is being paid to the diseases peculiar to women, it becomes almost necessary that a chapter upon the history of the subject should precede others of a more practical character in a systematic work. A knowledge of what has been accomplished in reference to any subject, and what was known concerning it in previous ages, cannot fail to interest the student and render him more capable of appreciating recent advances. In this way, too, a taste for the study of ancient literature may be inculcated, and many a useful hint, many a suggestive statement, may be met with which will germinate for the common good. Some of the most valuable contributions to modern gynecology will be found to be foreshadowed, or even plainly noticed, by the writers of a past age, and afterward entirely overlooked. As examples may be be cited the use of the uterine sound, sponge-tents, dilatation of the constricted cervix, and even the speculum itself. Indeed, we need not seek in ancient literature for illustrations of this fact, for nowhere could a more striking one be found than that of so valuable a procedure as Sims's operation for vesico-vaginal fistula being fully described in every detail in in 1834, and so completely forgotten in twenty years as to be accepted as entirely new at the end of that time.

There can be no doubt that a knowledge of medicine was possessed by the ancient Egyptians, whose literature has only within the last century been opened to profitable investigation. Until 1799 all concerning it was enshrouded in darkness. At that time a French engineer, while throwing up earthworks at Rosetta, discovered an insignificant-looking stone, which has since furnished the wanting key, its inscription being written in Greek as well as in the ancient hieroglyphics. Since then valuable papyri have been, thanks to the researches of De Sacy, Akerblad, and Champollion,.fully and satisfactorily deciphered. The data thus obtained carry the knowledge of medicine back to a period previous to three thousand years before Christ, and evince an attempt at rational treatment, Egyptologists declare, which surpasses that displayed by the early Greeks. The "Papyrus of Berlin," the earliest record of medicine, is singularly free from superstitious doctrines and use of charms in the treatment of disease, which at a later period crept in. Pliny informs us that in the times of the Ptolemies a medical school was established at Alexandria and dissections of the human body legalized. The Egyptians appear to have been especially skilful as oculists, and it is probable that attention was paid to the diseases of women, for among the six medical books in the collection Thoth, consisting of forty-two volumes, one devoted to this subject is particularly mentioned. Some modern Egyptologists have even stated that among the hieroglyphics the shape of the uterus can be recognized. But Egyptology is certainly to-day only in its first infancy. Hope that the future may bring forth a great deal more than the past has done with reference to it may be further founded upon the fact that Herodotus[1] distinctly announces that specialties existed among this primeval people. "Here," says he, "each physician applies himself to one disease only, and not more. All places abound in physicians—some for the eyes, others for the head, others for teeth, others for the parts about the belly, and others for internal diseases."

From biblical literature, which is so abundantly at our command, we learn almost as little upon our subject; and from the time of Moses, about 1500 B. C., to that of Hippocrates, 400 B. C., testimony of precise knowledge upon it is almost entirely wanting. This is the more astonishing when we bear in mind that in the Talmud are found evidences of a great deal of knowledge concerning the Cæsarean section and other subjects in obstetrics; that in the books of Moses we find intelligent reference to the hymen and menstruation; and that in the New Testament we see St. Luke, a physician of the time, recording the fact of "a woman having an issue of blood twelve years, which had spent all her living upon physicians, neither could be healed of any," etc.

Although we know so little concerning the knowledge possessed upon this subject by those who preceded the Greeks in civilization, we cannot doubt that they did much to instruct the latter in this as in other departments of learning. History everywhere records the fact that the Greeks were instructed by the Egyptians, as the Romans subsequently were by the Greeks.

With our present knowledge of the literature of the most ancient civilizations we must admit that with the writings of the Greek School, founded by Hippocrates, commences the history of gynecology. Three volumes were written upon the subject by authors contemporaneous with Hippocrates. They have ordinarily been attributed to him, but Dr. Francis Adams, the translator of the works of Hippocrates for the Sydenham Society, declares them to be "ancient, but spurious, whose author is not known." In these books the subjects of metritis, induration, menstrual disorders, displacements, etc. are discussed. Aretæus, Galen, Archigenes, and Celsus, who probably lived in the first and second centuries, all treated of gynecology, the first describing the vaginal touch, the varieties of leucorrhœa, and ulceration of the womb; while the second makes the first allusion on record to the speculum vaginæ as being a distinct instrument from the speculum ani; and the third gives a description of peri-uterine cellulitis which shows him to have been at least familiar with the fact that the tissues immediately connected with the uterus were liable to suppurative inflammation, the purulent products of which discharge themselves through the vagina or rectum.

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[1] Book ii. c. 84.

Soranus the Younger made important contributions to gynecology. He was educated at Alexandria, and went, to Rome in the year 220 B. C., where he wrote his celebrated work *De Utero et Pudendo Muliebri.* He is the oldest historian of medicine and the biographer of Hippocrates. His accurate descriptions of the sexual organs were much admired. He takes pains to assure his readers that he dissected the human cadaver, and not monkeys, as did Galen and others. He compared the form of the uterus to a cupping-glass, showed the relation of this viscus to the ilium and sacrum, and made known the changes which the os undergoes during pregnancy. He attributes procidentia to a separation of the internal membrane of the uterus, speaks of the sympathy which exists between the womb and the mammary gland, and describes the hymen and clitoris. He understood digital exploration and the use of the uterine sound and vaginal speculum. Many of the ancient writers confounded the uterus with the vagina; he distinguished the one from the other very clearly. Soranus likewise differentiated pregnancy from ascites and solid tumors, and laid stress upon the absence of tympanites and fluctuation of solid tumors as a means of distinguishing them from ascites, in which they are present.

From this time, for centuries, there is abundant evidence that the study of the subject was pursued with vigor, but so many of the works of the authors of those periods exist only in fragments, and so many are strongly suspected of being fictitious, that we pass them over to stop at the faithful compilation of Aëtius,[1] who flourished at Alexandria in the sixth century after Christ. His works, compiled in the great library at Alexandria, contain a digest of what was known and done by his predecessors and contemporaries, and offer the fullest and most reliable evidence concerning the knowledge of those times. In quoting him and his immediate successor, Paulus Ægineta, who was also a compiler, though a far less conscientious one, we must be understood as recording, not the views of these individuals, but those entertained by physicians who lived from the time of Hippocrates to the time of their writing, a period of about one thousand years.

In his sixteenth book Aëtius treats of the diseases of women in such a manner as to leave no doubt as to his having had a thorough knowledge of many disorders and means of investigation and treatment, which, being rediscovered thirteen hundred years afterward, have, in many instances, been regarded by us as entirely new. Thus he speaks of the speculum, sponge-tents, peri-uterine cellulitis, medicated pessaries, vaginal injections, caustics for ulcers of the cervix, dilatation of the constricted cervix, a sound for replacing the uterus, etc.

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[1] We are indebted to the library of the New York Hospital for an opportunity of fully consulting this and other rare works which were accumulated by the late Dr. John Watson.

As we have already stated, Soranus before Christ, and Galen in the second century, speak of the speculum vaginæ; but Aëtius still more clearly mentions it, and gives rules for its introduction which are copied almost verbatim by Paulus without acknowledgment. The use of sponge-tents he very fully describes, telling of their mode of preparation, and even advising that a thread should be passed through them for removal, and that succession of them should be employed till complete dilatation is accomplished.[1] The importance of injections, the douche, hip-baths, and application of caustics for ulcers of the cervix he also dwells upon, and advises the dilatation of a constricted cervix by means of a tin tube. The variety of vaginal injections in use among the Greeks was as great as that of to-day. As astringents, pomegranate-rind, galls, plantain, rose oil, alum, sumach, etc. were employed, and as emollients, linseed, poppies, barley, etc., exactly as we use them now. They relied to a great extent upon the use of medicated pessaries in the cure of ulcerations and inflammatory engorgements, employing wool covered with wax or butter mixed with saffron, verdigris, litharge, etc. Octavius Horatianus even goes so far as to advise a mixture of arsenic, quicklime, and sandarach in very foul ulcers. In addition to injections and pessaries, Aëtius mentions the use of vapor, medicated or simple, conducted to the cervix by means of a reed passed up the vagina.

The use of a uterine sound, passed into the uterus and employed as a repositor, is likewise alluded to by this author in a passage where he advises that displacements of the uterus should be corrected *specillo et digito.*

Paul of Ægina, who succeeded Aëtius, alludes distinctly to the speculum as an instrument in general use before his time. "If, therefore," says he, "the ulceration be within reach, it is detected by the dioptra; but if deep-seated, by the discharges." And again: "The person using the speculum should measure with a probe the depth of the woman's vagina, lest, the tube of the speculum being too long, it should happen that the uterus be pressed upon."

It is curious to see how, even in many minor matters, the ancients anticipated discoveries which our contemporaries have brought forward as entirely new. For example, the air-pessary, made so popular in France and other countries by Gariel, is described and recommended by the Greeks. Colombat[2] declares that "the ancient Greek physicians made use of pessaries like those just mentioned (air-pessaries), of the form and length of the male organ, which is the reason why they are called *πριαπισχτωα*, or priapiform pessaries." Albucasis, in 1104, describes herpes uterinus; and uterine hemorrhoids are alluded to by Paulus Ægineta[3] in this explicit manner: "Hemorrhoids form about the mouth and neck of the uterus, which will be discovered by the speculum." And thus it is with so many other modern suggestions that the student of ancient medical literature is most willing to admit the truth of the proposition, formulated by Aristotle over two thousand years ago, that "probably all art and all wisdom have often been already fully explored and again quite forgotten."

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[1] Dr. H. G. Wright, *Med.-Chir. Rev.*, lxxi.

[2] *Diseases of Females*, Meigs's translation, p. 152.

[3] Sydenham Society's edition, vol. i. p. 645.

The learning of the Greek School was appropriated by the Roman, which was an offshoot from it, as the writings of Celsus, Aspasia, Moschion, and Antyllus abundantly testify. But the knowledge of the schools of Greece and Rome was destined to be scattered abroad. At the period of the subjugation of Egypt and the destruction of the celebrated library at Alexandria by the Saracens, A. D. 640, it passed as a trophy of war into the hands of the Moslem invaders. "In a few centuries the fanatics of Mohammed had altogether changed their appearance," says the learned Draper.[1] "When the Arabs conquered Egypt their conduct was that of bigoted fanatics; it justified the accusation made by some against them, that they burned the Alexandrian library for the purpose of heating the baths. But scarcely were they settled in their new dominion when they exhibited an extraordinary change. At once they became lovers and zealous cultivators of learning." The physicians of Alexandria were greeted by them as instructors, and from the seed thus planted sprang the Arabian School. With other information of course they gained that pertaining to gynecology, but, the Mohammedan laws forbidding the examination of women by one of the opposite sex, the study languished in their hands; and although Rhazes, Avicenna, and their successors copied from Greek writers upon it, a want of zeal, due to want of personal observation and experience, allowed a retrograde movement to occur which left the subject enveloped in darkness for centuries afterward. Albucasis, one of the last of this school, flourished at the end of the eleventh century, and after him, although from time to time writers of greater or less merit on diseases peculiar to women appeared, nothing worthy of special note occurs, except the occasional allusion to the speculum, which had evidently fallen almost entirely into disuse.

We have, then, sufficient data to warrant the belief that the physicians who flourished from the foundation of the Greek School of medicine, 400 years before Christ, to the dispersion of the Alexandrian School by the Saracens, 640 years after Christ, were well informed in gynecology, and were familiar with means of investigation which were subsequently lost or ceased to be appreciated. They fully sustain the statement of the English translator of the works of Hippocrates, that "they furnish the most indubitable proof that the obstetrical art had been cultivated with most extraordinary ability at an early period."

It must not, however, be supposed that the knowledge of the ancients was of the same exact and scientific nature as that which has prevailed since the modern introduction of the speculum. He who seeks in this literature for distinct and lucid pathological data will surely meet with disappointment. They did not sufficiently separate inflammations of the puerperal and non-puerperal uterus, confounded affections of that organ with those of the pelvic areolar tissue, and made no distinctions between diseases of the mucous membrane and parenchyma, nor the morbid states of the neck and body. Among their remedies were numerous articles which to-day we regard as inert or even injurious, as pigeon's dung, woman's milk, stag's marrow, etc.; and Aëtius and Paulus seem to have been as partial to the "grease of geese" as our lower classes are at present. To make amends for this, many a valuable and suggestive thought may be gleaned with reference to diagnosis and treatment. This has certainly been proved by our experience of the past, and we have no evidence to warrant the belief that these rich mines have yet been exhausted.

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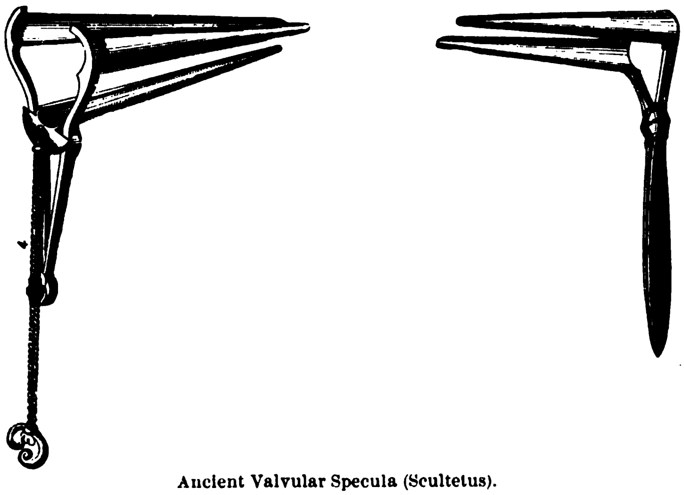
[1] *Intellectual Development of Europe*, p. 285.

The learning of the Arabians was in time, like that of the rest of the world, gradually enshrouded by the ignorance and superstition of the period termed the "Dark Ages." During that time many of their writings, as well as those of the Greek and Roman schools, were destroyed or lost; but as society emerged from the darkness which overshadowed its intelligence, we see the thread at once taken up and followed, though languidly and without vigor, to the beginning of the nineteenth century.

Toward the middle of the seventeenth century we find very special and full allusion made to the speculum and its uses by Ambrose Paré and Scultetus, the instrument being well represented by diagrams, with descriptions attached.

"Fig. 1," says Scultetus, "is an instrument which they call 'speculum ani, vaginæ, et uteri,' in that by its help ulcers of the rectum, vagina, and uterus may be seen, to be carefully observed, according to their extent and kind."

FIG. 1.



Ancient Valvular Specula (Scultetus).

Aëtius and Paulus evidently knew of a tubular speculum, since they say, "lest the tube of the speculum be too long," etc.; but Scultetus, as already shown, figures a bivalve and quadrivalve closely resembling those in our hands at present. It is worthy of mention, in this connection, that there is now preserved in the Museo Borbonico at Naples a bivalve speculum which was removed from the ruins of Pompeii.

It has already been stated that Aëtius makes reference to a sound for replacing the uterus. This is by no means the first notice of this useful instrument, for it is repeatedly mentioned by Hippocrates. One of six passages from writings imputed to him we translate from the work of Monsieur T. Gallard:[1]

"*Treatment for rendering fertile a sterile woman; attention is directed to that part which consists in replacing a displaced neck of the uterus.*

"Just after the patient has taken a bath and a fumigation, open uterine mouth, and replace it at the same time, if necessary, with a sound of tin or lead, at first small in size, then larger if it passes, until the difficulty seems remedied; dip the sound in any emollient preparation which may be thought best, and which should be rendered liquid by melting."[2]

A recent biographer of Harvey[3] remarks "that the older writers looked upon the vagina and uterus as one organ, and when they spoke of the former they either called it 'uterus' or 'cervix uteri.' What we now call the cervix uteri they called the internal cervix; and, as far as my reading goes, no operative procedure upon this part of the womb, when in its unimpregnated state, had ever been attempted before Harvey invented his dilator and used intra-uterine injections of sulphate of iron."

If the passage recently quoted does not carry conviction that the manipulations recommended have reference to the neck of the uterus, and not to the vagina, the following, from the same source, will do so:

"*Treatment*[4] *of cases in which the seminal fluid is not retained on account of an imperfection of the uterine orifice.*

"In those cases in which seminal fluid escapes immediately after intercourse, the cause is in the mouth of the womb. They should be treated thus: if the orifice is very much contracted it should be dilated with small bits of pine wood and lead." We cannot suppose that in cases in which intercourse was practicable any contraction below the os externum uteri could exist, rendering such dilatation necessary.

Professor Simpson[5] asserts that among the ancients the sound was resorted to only for dilatation of the cervix, and not for exploration and measurement. The *specillum* mentioned by Aëtius was employed for reposition, while Hippocrates advises the use of a sound hollowed out on one side and covered by medicated ointments: this "the operator introduces into the uterine orifice, and pushes onward so as to make it enter the interior of the uterus. When the medicinal substance is melted the sound is withdrawn."[6] In 1657 a probe, used as we now employ the uterine sound, and intended especially for uterine exploration, was actually described by Wierus,[7] and alluded to by Hilken, Cooke, and others. In 1771 it was employed by Levret for measuring the length of the uterine cavity in hypertrophy of the cervix, and subsequently as an aid to diagnosis by Chambon, Vigouroux, and Desormaux.

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[1] *Leçons cliniques sur les Maladies des Femmes*, p. 115.

[2] *Hippocrates Œuvres Complètes*, tome vii. p. 379.

[3] *Obstet. Journ. Great Britain and Ireland*, vol. i. p. 26.

[4] Gallard, *op. cit.*, p. 116. [5] *Obstet. Works.* [6] Gallard, *op. cit.*, p. 116.

[7] Dr. H. G. Wright, *Diseases of Women*, Eng. ed., vol. i. p. 135.

As we pass in review the chief works which appeared upon our subject in the eighteenth century, we find frequent mention of the speculum, which is spoken of as a matter of course in the treatment of uterine affections, and yet was evidently not so employed as to render it really a valuable aid in diagnosis or treatment. This constitutes one of the most curious episodes met with in the history of any discovery with which we are acquainted. A most simple and useful instrument was not only well known in ancient times, and subsequently fell into disuse, but fell into disuse without having ever been really forgotten. It was described by successive writers up to the nineteenth century in language as distinct as words could make it, and yet not only they who read, but they who wrote it, did not comprehend its meaning or appreciate its significance. Like the Indians possessed of the diamond, all saw and yet none valued. How could Ambrose Paré, for example, writing in 1640, have indicated its use more clearly than when he tells us, in chapter xix., that ulcers of the womb may be recognized "by the sight or by putting in a *speculum*"? In a copy of his works in the library of Dr. W. A. Hammond the word "speculum" is italicized in this sentence. Scultetus, as we have seen, not only described but figured the instrument in 1683.

In 1761, Astruc, "Royal Prof. of Physic at Paris," in describing occlusion of the vagina and obstruction to the menstrual flow, says: "There is nothing more required than to examine the vagina by introducing the finger into it, rubbed previously with oil or pomatum; but, if that be not sufficient, a *speculum uteri* may be used, or some other more simple instrument for dilatation, in order to be able, by means of the dilatation of the vagina, to judge by the sight of what the touch could not decide."

In 1801, forty years after this, Récamier is supposed by many to have invented the speculum. Most assuredly it was not for the invention, but for the regeneration of an instrument which had been curiously lost sight of, that the world was indebted to this great man, who was really the founder of the modern school of gynecology. Guided by the advice found in many works which his library must have contained —works with which to suppose him not to have been perfectly familiar would be to cast a slur upon his medical research—he employed a speculum vaginæ in 1801. Like his predecessors, he did not appreciate the great results which were to flow from it, nor does he appear to have regarded himself as having invented it. It was not until 1818 that he introduced it to the profession and gave it its place as a valuable addition to science. Can any one suppose that it could have required seventeen years of experimentation and study for a man with the talent of Récamier to have applied this simple and useful instrument to purposes of utility? Is it not more likely that the experience of seventeen years taught him the full value of the instrument? The credit which belongs to Récamier is not that of an inventor, but that, which is equally great, of having recognized the value of what was well known, but not appreciated by his predecessors and contemporaries.

Even before this fortunate revival, as the eighteenth century approached its close the glimmer of the new era which was about to dawn could clearly be detected in the advanced views which were promulgated by Garangeot and Astruc in France, and Denman, John Clark, and Hamilton in England. The early part of the nineteenth century found the field occupied chiefly by Sir Charles Clarke and Dr. Gooch in England, and Récamier and Lisfranc in France. These were not the only eminent writers of that time, but they were unquestionably those who chiefly moulded professional opinion.

Even at that period gynecologists divided themselves into two parties, which may be said to have coalesced only within recent years. In England the feeling was strongly in favor of regarding the local disorder as the result and not the cause of concomitant constitutional derangement, while in France the uterine disease was viewed as the main element, and the general condition regarded as dependent upon and resulting from it.

The great advantages of the speculum secured its rapid adoption in France. More slowly it forced its way, in spite of many prejudices, in Great Britain, and before a great many years had passed it was, throughout the civilized world, placed upon an enduring basis as one of the many boons bestowed by medicine upon humanity. The way being opened for investigation by this instrument, new aids to diagnosis and treatment were rapidly brought forward. In 1826, Guilbert read before the Academy of Medicine of Paris an essay proposing the application of leeches to the cervix. In 1828, Samuel Lair read before the same body a paper in which he counselled the use of the uterine sound, which had never been utilized. In 1832, M. Melier presented an essay, in which he offered two new suggestions in the treatment of uterine diseases—one, injections into the cavity of the cervix; the other, local applications through the vagina by dossils of lint saturated with astringents, narcotics, etc. His views are quoted extensively by French writers, and Nonat says that the author recognizes, "avec une franchise qui l'honore," that Boyle, Chaussier, Guillou, and others had a short time before him used similar means. Very curiously, neither Melier nor his commentators mention that both these suggestions are made and fully elaborated by Astruc in his excellent article upon "Ulcers of the Uterus." He describes these applications of medicated charpie very carefully, remarking that it is advisable to "tie a thread to every pledget, in order to draw it out again when it is proper to renew the dressing." And he not only advises injections of water, impregnated with different substances, into the cavity of the womb, but also the juices of plantain, houseleek, nightshade, etc. "For," says he, "as it is of consequence that these injections should enter into the uterus, where the ulcer has its seat, it is proper they should be made by a professor of midwifery capable of introducing skilfully the end of the canula into the orifice of the uterus," etc.

At this time arose the question as to cancer of the uterus, whether it was the local manifestation of a general blood state or the result of an inflammatory engorgement long neglected—a question which excited warm discussion and brought forth the most opposite views.

The ambition of Récamier was not satisfied with exposing the cervix uteri to view. He had the boldness to explore the cavity of the body of the organ, almost establishing the use of the sound, and even, by means of a species of scoop called a curette, ventured in certain cases to scrape its investing mucous membrane. In addition, he described, through one of his students, pelvic cellulitis, and gave the first intimation which modern observers have had of the possibility of pelvic hæmatocele.

The impulse given by Récamier to gynecology cannot be overestimated, for the instrument which he had rediscovered, and the merits of which he had appreciated, was destined to remove it from the field of speculation and theory and to place it in that of exact science. From about the year 1820 it began to attract general attention and to receive the endorsement of the profession.

The subject at that time received more notice in France than in any other country, and for the next twenty years Lisfranc, Boivin, Colombat, L'Héritier, Imbert, and others enriched its literature and advanced its interests. But it was not until toward the end of that time that any really remarkable advance was effected. Then it was that Kiwisch in Germany, Huguier in France, and Simpson in Great Britain took the lead in their respective countries.

It has been already stated that from the earliest period of medicine the uterine sound had been recommended, and that in the seventeenth, the eighteenth, and the nineteenth centuries this recommendation had been repeated. In spite of this, it had never become an instrument of practical value, and even after 1828, when Lair recommended it, it fell entirely out of notice. By a curious coincidence, Kiwisch, Simpson, and Huguier, without concert or communication with each other, about the same time urged its adoption, and by vigorous efforts forced it upon the attention of all interested in gynecology as a diagnostic means of inestimable value. Before this time the sound was practically unknown; after it, it held its place as one of our most valuable diagnostic resources.

The labors of Récamier marked an era in gynecology. One scarcely less important was effected by those of Simpson, who, appearing in the field about the year 1843, created an enthusiasm for the department and gave an impulse to it by the vigor and originality of his writings and the brilliancy of his contributions. His articles, indeed, first incited the study of uterine displacements in Great Britain, and to his efforts may be traced, in great degree, the interest which has been of late years aroused in that country with reference to uterine pathology. Until this time the subject had attracted very little attention there, and advances which had been made in it were due almost entirely to French pathologists. It is true that the excellent work of Sir Charles Clarke existed, but that warm and zealous interest which has since resulted in so much benefit to gynecology had not then been excited. But Prof. Simpson was not alone in this work. Dr. J. H. Bennet of London, at that time a young physician who had for some years served as *interne* in the hospitals of Paris, returned to his own country imbued with the views which Récamier and Lisfranc had disseminated among a large circle of followers. In 1845 the first edition of his work on *Inflammation of the Uterus* appeared; and it is safe to assert that no work of modern times, written upon any subject connected with our profession, has exerted a more decided and profound influence. Taking up the matter with a vigor and energy which forced attention, if not conviction, he produced an undeniable impression upon the profession, not only in his own country, but in Germany, France, and America. The chief points insisted upon in his work are these: 1. That inflammation is the chief factor in uterine affections, and that from it follow, as results, displacements, ulcerations, and affections of the appendages. 2. That menstrual troubles and leucorrhœa are merely symptoms of this morbid state. 3. That in the vast majority of cases inflammatory action will be found to confine itself to the cervical canal, and not to affect the cavity of the body. 4. The propriety of attacking the disease in its habitat by strong caustics.

It is now nearly half a century since the appearance of the first edition of Dr. Bennet's work, and since during that period his views were freely canvassed and vehemently opposed—since, too, his own experience had ripened and he had abundant time for more mature reflection—it must be a matter of interest to know to what extent his opinions were gradually modified. In the London *Lancet* appeared the abstract of a paper read by him before the British Medical Association in 1870, which served to contrast his more recent with his former views.

The purport of this paper will be best given in the recapitulation by which the author concludes it:

> "1. I consider that, under the influence of mechanical doctrines pushed to an extreme, uterine displacements are by many too much studied *per se*, independently of the inflammatory lesions that complicate and often occasion them. 2. That the examinations made to ascertain the existence of inflammatory complications are often not made with sufficient care and minuteness, as evidenced by the fact that I constantly see in practice cases in which inflammatory lesions have been entirely neglected, and the secondary displacements alone treated. 3. That inflammatory lesions are often the principal cause of the uterine displacements through the enlargement and increased weight of the uterus, or of a portion of its tissues, which they occasion. 4. That when such inflammatory conditions exist, as a rule they should be treated and cured, and then time given to nature to absorb morbid enlargements before mechanical means of treatment are resorted to."

Soon after the appearance of Dr. Bennet's work a discussion sprang up between its author on one side, and Drs. Robert Lee, West, and Tyler Smith on the other, with reference to the true character of ulceration of the neck, Dr. Bennet supporting the view that the cervix is often affected by inflammatory ulceration, and his opponents denying it. The importance which he attached to the matter may be appreciated from the following quotation. In reviewing the state of uterine pathology in Great Britain, as illustrated by the standard work of Sir Charles Clarke, he says: "Various forms of cancerous ulceration are carefully described, but the very existence of inflammatory ulceration is not mentioned. Now, when we reflect that, as I shall hereafter show, in nearly five cases out of six of *confirmed* uterine disease, in which chronic discharges, mucous, puriform, or sanguinolent, or other well-marked uterine symptoms are present, there exists inflammation or inflammatory ulceration of the cervix, it is easy to conceive how erroneous must be the views respecting uterine pathology of a medical school ignorant of so vitally important a circumstance."

One great advance which was effected by the work of Dr. Bennet was the placing upon a surer basis than it had yet occupied the differentiation of engorgement and induration from commencing cancer of the neck.

It would be well, before proceeding further, to consider very briefly the different pathological views which from this time, and even somewhat before it, were offered to the profession and more or less generally adopted. They may be thus enumerated:

1st. That inflammation is the starting-point of most of the affections of the uterus, and that a large number of evils follow this morbid state as results.

2d. That uterine disorder is dependent upon a constitutional derangement, and would yield without other treatment than that directed to the removal of the general condition.

3d. The view of Dr. Bennet, which is similar to the first mentioned, with this additional point, that metritis generally limits itself to the neck, and only exceptionally affects the body.

4th. The view of Dr. Tyler Smith, that leucorrhœa arising from glandular inflammation in the cervix is the cause of granular derangement of this part and of subsequent engorgement.

5th. The view that uterine disorders often, if not generally, commence in displacement, which is a primary and not a secondary condition, and that to relieve the train of morbid symptoms this, its exciting cause, should be first removed.

6th. The view that uterine disorder is commonly the result of ovarian inflammation, which, reacting on the womb, is the prime mover, in many cases, of its morbid states.

We have no intention of fully discussing here the merits of these theories, but will limit ourselves to a few words connected with each.

The theory mentioned first in this enumeration is the oldest on record, the writers of the Greek School, even, adopting it. Thus, Paulus Ægineta heads his chapter on the subject, "Inflammation of the Uterus and Change of its Position." One of the symptoms of such inflammation he considers to be retroversion of the uterus. In the beginning of the present century this was generally accepted in France. Lisfranc and Récamier adopted it, and it was transferred to and advocated in Great Britain by the writings of Dr. Bennet.

No one can devote himself to the practical study of uterine diseases without being impressed with the strong grounds which exist for the maintenance of the second of the theories mentioned. No grave uterine trouble affects the system for any length of time without reacting to a greater or less extent upon the general health. The nervous system becomes greatly disordered, the functions under its influence are badly performed, and derangement in hæmatosis is the invariable result. As the local disease often approaches stealthily, and may exist for a length of time without exciting suspicion, what is more natural than that many should view it as one of the numerous results of the general depreciation? These three facts, however, which will constantly repeat themselves—as often, we may say, as favorable cases offer for testing the question—will, we think, very generally lead to a distrust of the doctrine: 1st, The fact that uterine disease and constitutional derangement existing together, a cure can rarely be effected by general means *alone;* 2d, that the uterine affection being removed, the general state is at once improved; and 3d, that those general conditions which prostrate the vital forces to the last degree, as, for instance, tuberculosis, uræmia, scurvy, leucocythæmia, etc., destroy life without ever showing, unless as an exception to a rule, uterine disease as a consequence.

The constitutional depreciation of a woman will, however, sometimes prove a predisposing cause of local disease. As granular degeneration under the eyelids will arise from this cause, so will a kindred condition often occur on the cervix uteri, yet both will require local as well as general treatment. The enfeebled woman is more liable to subinvolution, passive congestion, and displacements after delivery than the strong; and inflammation of the glands of the cervix is a well-known result of phthisis pulmonalis, tertiary syphilis, and anæmia.

It is a well-accepted fact that an acrid uterine discharge will create abrasion of the os, follicular vaginitis, vulvitis, and pruritus, precisely as a profuse catarrhal secretion will produce an irritation of the upper lip. These conditions are more likely to occur in women with enfeebled constitutions and in those subject to catarrhal inflammation of all the mucous membranes. The discovery of a lesion, the significance of which we owe chiefly to Dr. Thomas Addis Emmet, has in recent years added a new factor to the pathology of uterine discharges and cervical erosions, by showing that in women who have borne children these pathological conditions are in the majority of cases due to a laceration of the cervix produced by parturition. The old theories of Bennet, Tilt, Tyler Smith, and others as to the production of many uterine diseases have, in consequence, undergone many decided modifications, and Dr. Emmet's discovery may be said to work a new era in uterine pathology.

We have allowed the preceding views of Bennet, Smith, and Tilt to stand substantially unchanged from the last edition, so that the reader may see the evolution through which uterine pathology has passed during the last fifty years. Practically, these theories may now be looked upon as ancient history.

Some forty years ago the French School, with Velpeau at their head, and the profession of this country, led by Hugh L. Hodge of Philadelphia, accepted the belief that uterine displacements were the primary cause of a large majority of the ailments of the female sex, and that the remedy for these ailments lay chiefly in the restoration and retention of the uterus in its normal position. In their opinion, the engorgement, subinvolution, chronic enlargements, and catarrhs of that organ were merely secondary results of the displacement. A more recent adherent to these views is Graily Hewitt of London, who, however, attached special importance to the distortions or flexions of the uterus, rather than to the simple versions. At present the feeling predominates that a simple flexion or version of the uterus does not in itself produce either local or distant pain or distress, but that it is the subinvolution, catarrh, or laceration of the cervix which so very frequently precedes or accompanies the displacement which causes the symptoms of which the patient complains.

In many women complaining of pelvic pain the ovarian region is found to be the seat of the pain, and not the uterus, not only the ovaries, but also the tubes, being found to be prolapsed, enlarged, adherent, and exquisitely tender to the touch. The uterus may be perfectly normal, or it may be found retroverted, prolapsed, adherent, or otherwise diseased. Of recent years our attention has been called more decidedly to the great frequency of disease of the appendages, and nowadays no pelvic examination would be complete which omitted a careful exploration of those organs.

Among the first to call attention to the ovaries as a source of pelvic pain was Tilt in 1850, and Ritchie at about the same time pointed out the occurrence of prolapse of those organs. Tilt ascribed to the normal function of the ovaries—namely, ovulation—and their regularly recurrent menstrual engorgement a most important rôle in the production of ovarian disease. He held that morbid ovulation was a most frequent cause of oöphoritis, and that consequent pelvic peritonitis may commonly follow; further, that subacute oöphoritis is very common, and not unfrequently causes so-called chronic metritis; and, finally, that disorders of menstruation are very often due to congestions and inflammations of the ovaries.

It is a curious feature that the Fallopian tubes at that time came in for almost no share in the etiology of the pelvic pain. Of recent observers it is chiefly Lawson Tait to whom the credit is due of having first demonstrated the frequency of disease of the tubes, the only too common futility of palliative treatment, and the sure and comparatively safe cure of the disease by the removal of the diseased organs through abdominal section. At the present day, while ovaries are frequently congested and inflamed, and while they may become adherent to adjacent surfaces of the peritoneum, and while they may become the seat of abscess or gradually develop into large, conglomerate tumors which are curable only by surgical removal, still, the originally neglected Fallopian tubes must be admitted to play an equally important part in pelvic pathology. According to Noeggerath and some of his adherents, the frequency of gonorrhœal infection of the female is the chief reason for the prevalence of tubal diseases. This view is, however, not as universally accepted as its promulgators would wish it to be, since all candid gynecologists must admit that they are constantly meeting with cases of tubal inflammation as a result of exposure to cold, or the spread of a perfectly benign endometritis, or of septic infection after abortion or normal parturition, where the suspicion of gonorrhœal contagion can be absolutely excluded.

The first impulse to the remarkable development which has taken place in surgical gynecology since 1850 was given chiefly by four men—Récamier in France, Simpson in Great Britain, Simon in Germany, and Sims in America. Simpson was the first to introduce chloroform as an anæsthetic and to popularize the uterine sound; Récamier invented the uterine curette and reintroduced the tubular speculum; Simon cured the largest vesico-vaginal fistulæ and perineal lacerations by methods peculiarly his own; and Sims invented the speculum and method of examination now universally known by his name, which has revolutionized the modern practice of gynecology. Since their time most rapid advances have been made, chiefly in the surgical treatment of the diseases of women. Under the lead of Keith, Spencer Wells, Barnes, Bantock, Tait in Great Britain; of Péan, Pozzi, Doléris, Courty in France; of Hegar, Spiegelberg, Schroeder, Martin, and Fritsch in Germany; and of Emmet, Peaslee, Goodell, Battey, Reamy, and hosts of younger men in the United States, the severest and most dangerous surgical operations on the female genital organs are now performed with comparative impunity; removals of ovarian tumors and diseased appendages are of every-day occurrence; lacerations of the perineum and cervix, vesico-vaginal fistulæ, and distortions of the uterine canal are successfully operated on and cured; the retroflexed and prolapsed uterus is stitched to the anterior abdominal wall or suspended by shortening the round ligaments, etc., and new and ingenious operations are constantly devised for the cure of hitherto intractable conditions.

Comparisons are invidious, but we think that the palm will freely be given to the Germans for painstaking and laborious researches in uterine pathology during the last fifty years. Beginning with the Nestors, Kiwisch and Scanzoni, who reigned supreme in the old days of medical gynecology, we have to record the names of Veit, Waldeyer, Klob, Rokitansky, His, Leopold, Wyder in Germany; Foulis, Doran, Hart, and Barbour in Great Britain; Bernutz, Goupil, Cornil, and De Sinéty in France, who have made original researches on the physiology, anatomy, and pathology of the female pelvic organs. The Germans and English, as we have already stated, have likewise distinguished themselves by their surgical innovations in the same field: the French, after an intermission of many years following the era of Récamier, during which time they devoted themselves chiefly to the study of obstetrics, have recently shown an active interest in surgical gynecology, and some of their younger men are rapidly coming to the front.

In the United States the practical tendency peculiar to the American people has shown itself more in the invention and popularization of technical and operative methods for the relief of suffering woman than by deep scientific researches into the structure and diseases of her pelvic organs. It is to this tendency that the world owes the idea and the performance of the first ovariotomy by Ephraim McDowell of

Kentucky in 1809, a now universally conceded fact. When Sims electrified the profession by his startling methods and operations, the old precepts of Meigs, Hodge, and Dewees were rapidly superseded, to a great extent at least, by the new surgical ideas and practice; and since that time in no land has more been done for surgical gynecology, and nowhere have the teachings of foreign gynecologists been more eagerly followed, than in this country. In making this statement we must not forget that it was an American, Hugh L. Hodge of Philadelphia, who first invented the ideal pessary for the support of the displaced uterus, which has served as the model for very nearly all subsequent pessaries which have stood the test of experience. Among other important discoveries emanating from this country, besides ovariotomy, may be mentioned the introduction of ether as an anæsthetic in surgical operations, the revival of the method by which vesico-vaginal fistulæ can be cured, the introduction into general practice of the examination of the pelvic organs by means of the Sims speculum, the removal of the normal ovaries for reflex nervous and mental disturbances, and the recognition of the importance of laceration of the cervix uteri as a factor in the production of uterine disease and its operative cure.

We have already referred to the invention of Sims's speculum and his method of examining the pelvic organs as inaugurating a new era in diagnosis and treatment. It may truly be said that from that period the practice of gynecology assumed an entirely new aspect, and possibilities were opened which before that time had no existence even in thought. With the old specula the vaginal walls were merely separated mechanically, and a limited view of them and the cervix was obtained. Manipulations and operations on the vagina and uterus were restricted so as to be almost valueless; but through the Sims speculum, acting as it does partly by gravitation and atmospheric distension of the vaginal walls, that canal and the cervix uteri are exposed so as to be perfectly accessible both to the eye and to many very important surgical manipulations which without it would be entirely impracticable. Even as recently as the last edition of this book, eleven years ago, it was thought necessary to explain the preference of the author for Sims's speculum, and to enter a plea for its universal adoption. Now, in this country, at least, no such explanation and no such plea are needed. The Sims speculum is now used by every physician who makes a pretence of examining and treating utero-pelvic diseases after the most approved fashion. Its use is taught in all our colleges and hospitals; all modern textbooks describe it; and there is no longer any question as to its pre-eminence over all other specula. It is true that the necessity of having a nurse or assistant to hold it still renders it less popular with the general practitioner than tubular or valvular specula, but as all specialists in modern gynecology have found it indispensable to a proper examination to see their patients at their offices, and to have in attendance a trained nurse who assists them during the examination, this objection naturally is done away with. The additional fact that it requires some experience to use Sims's speculum properly and painlessly will probably interfere with its ever becoming the favorite instrument of the general practitioner, but it is none the less true that it surpasses all other instruments of the kind.

For the purpose of familiarizing the profession with the diagnosis and treatment of disease schools have recently been started in different parts of this country where purely clinical instruction is given in the affections of the female sexual organs as well as in other practical branches of medicine. This new departure may be justly regarded as an important step in medical instruction. Medical students during the time of their college course have neither leisure nor opportunity, nor, indeed, sufficient knowledge, to learn and appreciate the details necessary to the practice of a specialty; later on, as practitioners, they know and feel their deficiencies, and find in these post-graduate schools the facilities which they necessarily missed before graduation.

Scarcely a word need be said as to the extension of the practice of medicine to members of the female sex. Their ability and zeal are undoubted, and the fact that they have now achieved for themselves a position in medicine, and that many lady practitioners throughout the world are meeting with well-merited success, shows that they supply a want which has no doubt been long felt by many women who were averse to exposing themselves to a male physician.

Among the greatest improvements in the surgical treatment of female diseases, may be justly classed the introduction into practice, chiefly as the result of the teachings of general surgery, of perfect, scrupulous cleanliness in all the dealings of the surgeon with his patients; and this *sine quâ non* can be obtained either by the use of chemical so-called germicidal solutions or by employing an abundance of soap and boiled water for the cleansing of hands, instruments, and living tissues which are liable to be infected. By the careful use of these precautions surgical operations, even of the greatest magnitude, in and outside of the peritoneal cavity, are now performed with perfect safety, with the almost absolute exclusion of the former danger of septic infection.

We are so often consulted by recent graduates as to the works which they should make the basis of a library upon gynecology that we feel that we may render a service by the following list. The following older authors may be of interest to the student of historical gynecology: Nonat, Aran, Becquerel, Blatin et Nivet, West, Tilt, Bennet, Simpson, Churchill, Sims, Baker Brown, Scanzoni, Meigs, Bedford, Colombat, Ashwell, McClintock, Hodge, Klob, Spencer Wells, Kiwisch, Wright, Duncan, Athill, Gallard, Atlee, Leblond.

Of the modern textbooks we would recommend: Barnes, Byford, Skene, Hart and Barbour, Tait, Emmet, Hegar and Kaltenbach (*Die Operative Gynäkologie*), Schroeder, Greig Smith (*Abdominal Surgery*), Mundé (*Minor Surg.*, *Gynecology*), Pozzi, Martin, Winckel, Fritsch, Graily Hewitt.

The following journals are now devoted to this subject.

American Journal of Obstetrics and Diseases of Women and Children; Annals of Gynecology and Pædiatrics; British Gynæcological Journal; Centralblatt für Gynäkologie; Zeitschrift für Geburtshülfe und Gynäkologie; Archiv für Gynäkologie; Annales de Gynécologie; Archives de Tocologie.

CHAPTER II.

THE ETIOLOGY OF THE DISEASES PECULIAR TO WOMEN.

In investigating the causes of the diseases peculiar to women we shall especially refer to those which are active in this country. In doing this we desire to avoid all comparison between the frequency of such affections here and abroad, for in the absence of statistical evidence such an attempt would necessarily prove futile. Our chief reason for giving ourselves the limits herein prescribed is our desire to base the views advanced in this chapter entirely upon personal observation—to offer to the reader not the conventional doctrines prevalent upon the subject of which it treats, but those views which have impressed themselves upon our own minds as valid and valuable. With this object in view it is manifestly easier to write of habits and influences which come under one's daily observation and connect themselves with the experience of his daily life.

We shall divide the causes to which we shall draw attention into predisposing and exciting, premising their enumeration by the announcement that we do not propose to mention all of the former which are active, but to limit ourselves to those which are most prominent and which are to a great degree avoidable. Others—such, for example, as inherited constitutional vices—will be spoken of in connection with special diseases as they come under notice. Considering very fully the predisposing causes, we shall give merely an enumeration of the chief exciting ones, leaving the fuller consideration of the latter also for chapters devoted to special affections.

If we compare the present state of women in refined society over the world with that of the working peasants of the same latitudes, or with the North American squaws or the powerful negresses of the Southern States, we can with difficulty believe that they all sprung from the same parent stem and originally possessed the same physical capacities. Observation proves that women who are not exposed to depreciating influences can compete in strength and endurance with the men of their races, and in savage countries they are sometimes regarded as superior to them. In the lower orders of animals this equality is still more marked. The mare endures as much as the horse, and some of our most celebrated racers have represented the female sex. The lioness is fully as dangerous to the hunter as her more majestic consort, and the bitch proves as untiring in the chase as the most muscular dog in the pack.

From all these facts we may logically argue that the human female, if properly developed and placed beyond causes which militate against her physical well-being, would be in no great degree the inferior of the male. This position we now assume, and maintain that the customs of civilized life have depreciated her powers of endurance and capacity for resisting disease. Our efforts will be directed to an endeavor to point out what these habits and influences are. We do not, of course, advance the statement that uterine diseases are unknown among uncivilized women, for we have too often seen prolapsus, retroversion, granular degeneration, and kindred disorders among the former slaves of this country to do so. These affections were, however, rare among them, and not *exceedingly common*, as they are amongst our white women; and even when they existed they did not so profoundly affect the constitutions of those suffering from them. As we shall hereafter point out, injuries inflicted by parturition play a most important rôle in the causation of these disorders. To such injuries as laceration of the perineum and cervix, disorders of involution, etc., the savage woman is unquestionably liable, and their occurrence would entail upon her the same evils which would result from them in the civilized. Yet how much less liable to their occurrence is the strong, well-developed, muscular frame of the former than the delicate, sensitive organization of the latter! And even if exposed to the baneful influence of these accidents, how much more able is she to resist their depreciating influences! There are in this city to-day thousands of poor women who go through the labors of their lives of drudgery with the uterus, vagina, and portions of the bladder and rectum in the condition of complete prolapse, the first two organs entirely, and the last two in great degree, outside of their bodies. How differently would the refined woman of a higher sphere be affected by a similar condition, and how utterly wretched would her life ordinarily be rendered!

In a woman of robust frame, healthy nervous system, and perfect blood-state, who lives a rational and carefully regulated life, an accident occurring at parturition, during menstruation, or at any time disconnected with these trying periods may produce serious disease. But in such a woman accidents are much less likely to occur, and even if they did so would produce much less serious consequences, than in one in whom the predisposing causes of disease of the genital system had for a lifetime, and even longer—for hereditary influences are powerful for evil in this connection—prepared the way for the easy establishment of pathological conditions.

Those influences which, growing out of the physically depreciating habits of civilized life, tend most decidedly to develop a predisposition to diseases of the female genitalia may thus be enumerated:

Neglect of outdoor exercise and physical development;
Overwork of brain, and excessive development of the nervous system;
Improprieties of dress;
Imprudence during menstruation;
Imprudence after parturition;
Non-recognition or neglect, on the part of the obstetrician, of injuries due to parturition;
Prevention of conception and induction of abortion;
Marriage with existing disease of genitalia;
Insufficient food;
Habitual constipation.

Neglect of Exercise and Physical Development.—There can be no doubt of the fact that, as a general rule, in the higher walks of life throughout the civilized world, the female, from infancy to old age, takes much less exercise than the male; and in the United States, owing to peculiarities of climate, this disproportion is probably more marked than in the countries of Europe. It is true that the last twenty years have seen a most gratifying improvement in this respect, and that the practice of outdoor amusements, such as rowing, bowling, archery, tennis, walking, horseback exercise, etc., has become much more general.

This, however, is greatly confined to the inhabitants of cities and to very young women, and even among these it must become much more general than it is to-day for it to produce the results which may in time be expected from it. The female by nature is, as a rule, much more inclined to a sedentary life than the male, and as her occupations keep her indoors, she is apt, whether living in city or country, to lose all taste for outdoor amusements, and to confine herself to the close, heated air of inhabited apartments. Among our farming population, where all the outdoor work is done by the males, the women commonly take less exercise in the open air than do those in our cities, and much of their time is spent in rooms heated by stoves which cook the air and render it dry and unwholesome.

In spite of the improvement we have mentioned, in our cities will to-day be found hundreds of ladies who do not walk a mile a day for weeks together, and many more who have never engaged in any exercise which called forth the action of other muscles than those employed in the quietest locomotion.

But nowhere is the neglect of early physical development more marked than in our boarding-schools and female seminaries, where every hour of the day from six in the morning to nine at night is allotted by rule to some special task. Instead of the girls being encouraged to engage in outdoor pursuits calculated to create muscular power, they are reared in the belief that such pastimes are hoydenish, unbecoming, and fit only for rough boys. Their hours of leisure are occupied by reading, music, drawing, or some similar light task, and an hour's walk every day is regarded as a degree of exercise quite sufficient for the requirements of health. By this plan the mind is constantly kept in the thraldom of control and chafes under the depressing influence of a never-ending surveillance. A set of romping schoolgirls could as profitably laugh by rule as really enjoy and improve by exercise under the eye of an instructress or professor of calisthenics. It is not the mere bodily exertion which is of benefit, but the total mental relaxation, the exhilaration, and the abandon which accompany it. The prisoner working for eight hours on the treadmill does not profit by it as the free and happy equestrian or oarsman does by one-eighth the time of exercise.

It is but fair to say that during the last few years a very marked improvement has taken place in this respect, and that now the majority of the advanced schools for young girls devote one or more hours every day to the systematic instruction of the pupils in calisthenics and gymnastic exercises. Whether all the sanitary and medical precautions are observed during these exercises which are particularly applicable to young *girls* is to us still a matter of some doubt. Personally, we know that, no matter whether menstruation be present or not, in *some* schools the regular routine of physical and mental exercise is not interrupted. Obviously, at the very time when the organs are developing their normal physiological functions such a course can but produce evil results.

One of the most important results of exercise is the increase of the peripheral circulation. This increases cutaneous exhalation and tends to equalize the circulation. The woman who neglects it is peculiarly prone to excessive uterine and ovarian congestion at menstrual epochs, and to sluggish circulation in these parts at all times. It is this fact which explaims the excellent results attainable in cases of uterine and ovarian disease from the use of passive motion by the Swedish movement cure, the Turkish bath, surf-bathing, and other methods which create turgescence of the cutaneous capillaries and exalt metamorphosis of tissue in the periphery of the body. One of the most valuable and beneficent means of treating these diseases that we know of is the use night and morning of a warm sponge-bath of water strongly impregnated with salt, followed by thorough friction with a rough towel and calisthenic exercises for five or ten minutes.

Excessive Development of the Nervous System.—The necessity for a due proportion existing between the development and strength of the nervous and muscular systems has always been recognized, and has given rise to the trite formula, "mens sanâ in corpore sano," as essential to health. Unfortunately, the restless, energetic, and ambitious spirit which actuates the people of the United States has prompted a plan of education which by its severity creates a vast disproportion between these two systems, and its effects are more especially exerted upon the female sex, in which the tendency to such loss of balance is much more marked than in the male. Girls of tender age are required to apply their minds too constantly, to master studies which are too difficult, and to tax their intellects by efforts of thought and memory which are too prolonged and laborious. The results are—rapid development of brain and nervous system, precocious talent, refined and cultivated taste, and a fascinating vivacity on the one hand; a morbid impressibility, great feebleness of muscular system, and marked tendency to disease in the generative organs on the other.

That this statement of the advantages which are gained and the price which is paid for them is perfectly true no American practitioner will deny. But the mere existence of the fact is not the most melancholy feature of the case; it is far more painful to see mothers listening to it, admitting its truth, and yet calmly and dispassionately choosing to make the trial, as we see them doing constantly.

When the day arrives in which our young growing girls are educated physically with the assiduity and system now bestowed upon their mental culture, when mothers desire to see their daughters grow up strong, well-developed, muscular women, and not merely highly educated and accomplished valetudinarians, one of the most prolific of the predisposing causes of disease of the genital organs will have disappeared. No amount of mental labor, no degree of mental culture, will fit a woman for the physical duties of wife and mother, or render her capable of bearing children competent to resist the inroads of disease.

In a woman developed by this pernicious system the physiological congestion of the pelvic organs attending ovulation produces pain which is known as "neuralgic dysmenorrhœa;" ovulation becomes irregular and abnormal, favoring the development of subacute oöphoritis; the normal hypertrophy of the uterus consequent upon utero-gestation slowly and imperfectly passes off, subinvolution often remaining; while the enfeebled muscular supports of the heavy organ allow it to lapse from its position and assume that of flexion or version.

Improprieties of Dress.—The dress adopted by the women of our times may be very graceful and becoming, it may possess the great advantages of developing the beauties of the figure and concealing its defects, but it certainly is conducive to the development of uterine diseases, and proves not merely a predisposing, but an exciting cause, of them. For the proper performance of the function of respiration an entire freedom of action should be given to the chest, and more especially is this needed at the base of the thorax, opposite the attachment of the important respiratory muscle, the diaphragm. The habit of contracting the body at the waist by tight clothing confines this part as if by splints; indeed, it accomplishes just what the surgeon does who bandages the chest for a fractured rib, with the intent of limiting thoracic and substituting abdominal respiration.

As the diaphragm, thus fettered, contracts, all lateral expansion being prevented, it presses the intestines upon the movable uterus, and forces this organ down upon the floor of the pelvis or lays it across it. In addition to the force thus exerted, a number of pounds, say from five to ten, are bound around the contracted waist and held up by the hips and the abdominal walls, which are rendered protuberant by the compression alluded to. The uterus is exposed to this downward pressure for fourteen hours out of every twenty-four; at stated intervals being still further pressed upon by a distended stomach.

In estimating the effects of direct pressure upon the position of the uterus its extreme mobility must be constantly borne in mind. No more striking evidence of this can be cited than the fact that in examining it by Sims's speculum, if the clothing be not loosened around the waist the cervix is thrown so far back into the hollow of the sacrum as to make its engagement in the field of the instrument often very difficult, and that attention to this point in the arrangement of the patient will at once remove the difficulty. While the uterus is exposed by the speculum it will be found to ascend with every expiratory effort and descend with every inspiration; and so distinct and constant are the rapid alterations of position thus induced that in operations in the vaginal canal the surgeon can tell with great certainty how respiration is being affected by the anæsthetic employed. An organ so easily and decidedly influenced as to position by such slight causes must necessarily be affected by a constriction which, in autopsy, will sometimes be found to have left the impress of the ribs upon the liver, producing depressions corresponding to them.

Corseting, lacing, and the wearing of tight and heavy clothing also produce a deleterious effect in quite another way. Pressure against the abdominal and thoracic muscles and over the diaphragm produces in them a partial paresis. This impairs abdominal as well as thoracic respiration, to a great extent counteracts the important retentive power of the abdomen over the pelvic viscera, and allows the influence of gravitation, which before was by that means antagonized, to cause displacement. This result of a pernicious habit cannot be too thoroughly appreciated or too much insisted upon. So prominent is it in etiology that we might well have considered it under the head of exciting causes. By the direct influences of pressure just considered, and the paresis of thoracic, abdominal, and diaphragmatic muscular fibres now alluded to, the abdominal viscera press upon the growing uterus of the young girl, and, the fundus being bent toward the cervix, one uterine wall develops much more rapidly than the other, and at puberty the menstrual effort finds itself interfered with by closure of the cervical canal, and an origin for uterine disease is created thereby.

To a woman who has systematically displaced her uterus by years of imprudence the act of sexual intercourse, which in one whose organs maintain a normal position is a physiological process devoid of pathological results, becomes an absolute and positive source of disease. The axis of the uterus is not identical with that of the vagina. While the latter has an axis coincident with that of the inferior strait, the former has one similar to that of the superior. This arrangement provides for the passage of the male organ below the cervix into the posterior cul-de-sac, the cervix thus escaping injury. But let the uterus be forced down, as it is by the prevailing styles of fashionable dress, even to the distance of one inch, and the natural relation of the parts is altered. The cervix is directly injured, and thus a physiological process is insensibly merged into one productive of pathological results. How often do we see uterine disease occur just after matrimony, even where no excesses have been committed! It is not an excessive indulgence in coition which so often produces this result, but the indulgence to any degree on the part of a woman who has distorted the natural relations of the genital organs.

But this is by no means the only method by which displacement of the uterus may induce disease of its structures. It disorders the circulation in the displaced organ, and produces passive congestion and its resulting hypertrophy, prevents the free escape of menstrual blood by pressing the os against the vagina, creates flexion, causes friction of the cervix against the floor of the pelvis, and stretches the uterine ligaments and destroys their power and efficiency.

These facts should be carefully borne in mind by the physician who attempts to relieve uterine displacements by the use of pessaries. If he merely replaces the displaced organ and relies for its support upon a pessary, he will often fail in accomplishing the desired result. He is striving at great disadvantage with a short lever power against the weight, not of the uterus alone, but of the superimposed viscera pressed downward by several pounds of clothing, which add their weight at the same time that they constrict the waist and substitute abdominal for thoracic respiration. Thus employed, the pessary will often give great pain, and so injure the parts upon which it rests as to necessitate removal, and the practitioner will find himself cut off from one of his most valuable resources. Should he, on the other hand, before employing a pessary, remove all constriction and weight from the abdominal walls, employ a well-fitting abdominal supporter over the hypogastrium, so as to aid the exhausted abdominal muscles in their work, keep the displaced and congested uterus out of the cavity of the pelvis by a tampon of medicated cotton, or bring gravitation to his assistance by the position of the patient, he will ordinarily at the end of a week be able to employ with great advantage the same pessary which at first seemed to accomplish evil and not good.

Imprudence during Menstruation is a prolific source of disease. Some women, through ignorance, many through recklessness, and a few from necessity, go out lightly clad in the most inclement weather during this period, and many suffer in consequence from violent congestive dysmenorrhœa, and often from endometritis. Every practitioner will meet with a certain number of cases of uterine disease which have this origin, and run on for years, ending, perhaps, in parenchymatous disease which may prove incurable.

During a period in which the ovaries and uterus are intensely engorged, in which the surface of the ovary is broken through by the escaping ovule, and the nervous system is in an unusual state of excitability, ordinary prudence would suggest that the body should be well covered, that the congested organs should be left at rest, and that exposure to cold and moisture should be sedulously avoided. We need scarcely say that infractions of this rule are of every-day occurrence, and that cases come continually to our knowledge where women, even of the highest intelligence, expose themselves to the dangers of cold and violent exercise by skating, dancing, and long walks during the menstrual period.

The immediate result of exposure during menstruation is most commonly inflammation of the mucous membrane of the uterus. Such an inflammation, once excited, will often go on for years, and in time end in parenchymatous disease, entailing in its progress dysmenorrhœa, sterility, pelvic pain, and gastric disorders which impair indigestion and nutrition. Many cases, too, of pelvic peritonitis, cellulitis, and hæmatocele develop at this trying period of congestion and nervous exaltation.

Imprudence after Parturition.—No sooner does fixation of the impregnated ovum upon the uterine surface occur than a surprising stimulation is exerted upon the fibre-cells forming part of the uterine parenchyma, which grow with rapidity, enlarging the organ *pari passu* with the requirements of its increasing contents. After the expulsion of the embryo, either at full time or at any period of pregnancy, the fibres thus developed undergo a fatty degeneration and absorption, which has received the name of involution. This process occurs rapidly after abortion, but after labor at term it requires six weeks for its full accomplishment. In order that it may proceed with normal rapidity and certainty perfect rest is essential, and the woman who rises too soon, and resumes her usual occupations while the lochial discharge is still existing, risks the results of interference with it. Besides this, the uterus is much heavier than usual, and the additional danger of the induction of displacement is incurred by too early exertion. Lastly, the mucous membrane lining the cavity of the uterus is for some time after parturition in an abnormal state, and is peculiarly liable to disease from exposure to cold and moisture. A very valid objection may be made to this view that in the lower walks of life women rise after labor and attend to their duties with impunity on about the ninth day, and yet enjoy a marked immunity from uterine affections. This is true; but let it be remembered that they are unaffected by the influences to which we have alluded as calculated to enfeeble and deteriorate their generative systems.

Another influence connected with parturition, which develops itself much more decidedly among the higher than the lower classes, is the pernicious habit of tight bandaging. For three or four weeks after delivery the nurse commonly applies two folded towels over the enlarged uterus, and by powerful compression by a bandage forces the organ backward into the hollow of the sacrum. This is supposed to preserve the comeliness of the figure, and the reputation of many a nurse rests mainly upon the thoroughness with which she develops an influence that is fruitful of evil in displacing an enlarged uterus in a woman who for a fortnight at least lies chiefly upon her back. That a well-fitting bandage, only tight enough to give support, applied after delivery, proves a source of comfort to the woman, we are not disposed to deny. In this way we have always employed one. But we feel very sure that a great deal of superstition attaches in the lying-in room to this appliance, both as a means of preventing deterioration of the figure and post-partum hemorrhage. Uterine contraction should be secured by vital, not mechanical, means, and no amount of compression by a bandage will cause the over-distended abdominal muscles, skin, fasciæ, and areolar tissue to return to their original condition. Not only should tight bandaging be avoided after delivery, but the position should be systematically changed at intervals from the dorsal to the lateral decubitus. We are convinced that uterine displacement is one of the most fruitful causes of subinvolution. As, during the six weeks or two months succeeding delivery, the process of retrograde metamorphosis, called involution, progresses, the uterus, under untoward influences, many of which are developed by the routine management of the lying-in chamber, becomes displaced. This results in impeded venous return from its tissues; the process of involution is checked; and months or years afterward the patient, being forced to apply to a physician, is informed that she has suffered and is suffering from metritis of a chronic character of which displacement is a complication or result.

Every practitioner frequently hears that some lady has been injured for life "because she was not properly bandaged at her last confinement," and either doctor or nurse, possibly both, are severely censured for the culpable neglect. Too often such censure is listened to in silence, and the party supposing herself injured is allowed to hold the same opinion still. It is the duty of every physician to inform those coming under his influence as to the futility of trusting to the obstetric bandage, or, if he cannot conscientiously do so, to review his opinion upon the subject and see whether his own confidence is not misplaced.

Non-recognition or Neglect of Injuries due to Parturition.—When it shall become the duty of the obstetrician, as it surely soon will do under the influence of advancing knowledge, before relinquishing the care of the recently-delivered woman to inform himself thoroughly as to the existence of laceration of the cervix or perineum; when the false and vicious doctrine of undervaluing and ignoring these grave accidents is silenced for ever; and when a neglect of their early repair by surgical resort shall be regarded as a flagrant obstetrical dereliction,—then the number of women affected by pelvic disorders will become suddenly and wonderfully diminished. Since the last edition of this book was written a great and very salutary change has taken place in that part of the medical profession which practices obstetrics, chiefly in consequence of the dissemination of the doctrines of antisepsis. Nowadays, no physician who lays claim to an honest and conscientious performance of his duties will attend an obstetric case without a scrupulous attention to all the minute details as regards cleanliness of person, instruments, and clothes which his patient's safety from septic infection demands. The old idea that the functions of the obstetrician consisted merely in watching by the woman's bedside until the child was ready to be born, then assisting in its safe delivery, and, after having performed the duties, now relegated to the trained nurse, of making mother and child comfortable, taking his departure with a few well-turned compliments, is now happily—at least among progressive practitioners—a thing of the past. An obstetrician at the present time should be chosen not so much for his courtliness of manner and kindness of disposition, as for his skill in diagnosis and operating and his scrupulous attention to the improved practices of modern times. It is to these, particularly to the observance of antiseptic rules, that the present exceedingly low mortality from obstetric causes is due. Unfortunately, in spite of all our teachings, there are still practitioners who, day after day, year after year, send forth women with lacerated cervices and ununited perinea to furnish to the gynecologist in the future cases of uterine engorgement, leucorrhœa, prolapsus and other displacements, cystitis, and a long list of pathological conditions which will cling to them for life, sapping their usefulness and destroying the happiness of their households.

Prevention of Conception and Induction of Abortion.—Means established for the accomplishment of the first of these ends are often productive of uterine disorder. This will not be wondered at when the harshness of some of them is borne in mind. The workings of nature in this, as in all other physiological processes, are too perfect, too accurately and delicately adjusted, not to be interfered with materially by the clumsy and inappropriate measures adopted to frustrate them. The practice is becoming exceedingly common, as every physician is aware—so common, indeed, that in the older portions of this country, unfortunately, it must be said, in the more civilized and educated, it is by no means usual to meet with large families of children.

The fact is not an agreeable one to deal with, and the facts which we are citing may prove unacceptable to many of our countrymen, but it is one which is rapidly assuming proportions which must influence the future population of our country. It is useless to ignore it. If an evil is to be eradicated, the first step toward such a consummation is its recognition, and what class of men can more immediately and more effectually grapple with this one than physicians?

With these statements we leave this unattractive subject to deal with another, which from its importance cannot conscientiously be passed over in silence. Statistics showing the frequency of criminal abortion never have been, and never will be written, for the crime creeps stealthily beneath the scrutiny of society. That this criminal practice constitutes a prolific source of uterine disease no one engaged in gynecology can for a moment doubt. So impressed with this fact are the physicians of the United States that some years ago, at its meeting in New York, the American Medical Association offered a prize for a "short and comprehensive tract for circulation among females for the purpose of enlightening them upon the criminality and physical evils of forced abortions." Unfortunately, in spite of the many warnings and exhortations both from the medical and clerical profession, this crying evil is still by far too prevalent among even the higher ranks of our society. And the scoundrel who grows rich by pandering to the evil instincts of women who for the sake of convenience, economy, or secrecy apply to be rid of their burden, goes on unpunished in the face of our criminal laws and our emphatic protests. Only the most strenuous enforcement of the existing or the enactment of new, still more stringent laws, together with the inculcation of a more healthy sentiment by the medical profession and the clergy, would gradually diminish the evil.

Marriage with Existing Uterine Disease.—It is a common practice with physicians to recommend marriage as a cure for uterine disease. There are a sufficient number of abnormal conditions which childbearing cures to make the practice appear legitimate, but a vast deal of harm frequently results from it. A constricted cervix which causes dysmenorrhœa, a pure endometritis of neck or body, or an inactive state of the ovaries which results in amenorrhœa, may be relieved by the parturient act; but displacement, peri-uterine cellulitis, or pelvic peritonitis will very often produce evil results after labor, and very generally return with renewed violence as soon as involution has been accomplished. The advice is too often given empirically, and, like all such counsel, is hazardous in its results. Our experience leads us to fear a return of such conditions after childbearing, even in a patient whom we considered cured at the time of marriage. The obvious remedy in such cases is to advise a local examination if the symptoms seem to warrant it, and the adoption of the proper treatment for the cure of the case. It is better that an unmarried woman should be subjected to the trial and discomfort of such examination and treatment than that her married life should be rendered wretched by some previously unrecognized pelvic disease.

Insufficient Food.—Many diseases of the uterus are established, and a still larger number perpetuated, by impoverished blood and the disordered nerve-state dependent upon spanæmia. So well known is this fact that a generous diet commonly constitutes an important element of treatment, and its result in improved hematosis is hailed as the harbinger of approaching improvement. The tone of the uterus—that is, its muscular strength and power of resistance—is decidedly affected by want of sufficient nutrient material, and flexions are a frequent consequence, as Dr. Graily Hewitt has ably pointed out; engorgement of the mucous membranes of the uterus, Fallopian tubes, and vagina is favored by the same influence; and it is beyond doubt that a feeble, atonic state of the uterine ligaments is engendered and kept up by it. To no nation in the world is a full supply of the most nutritious food so attainable as to the inhabitants of the United States. And yet it is no exaggeration to maintain that the American woman, except in our cities, is at least half starved. She suffers not from an enforced but a voluntary starvation, which, however, none the less impoverishes her blood and impairs her nerve-power. Let any one travel through our farming regions and examine closely the women with whom he meets, and he must admit that the robust, buxom, florid lass and matron is the exception; the pale, lank, and emaciated the rule.

These women are not overworked, for this country knows no hard-worked peasantry, They are under-fed, however, from their cradles to their graves. It must be remembered that it is not merely material introduced into the stomach which nourishes the body, but the introduction of material capable of making blood of good quality which does so. The eating of salt fish and meats in place of fresh, the drinking of large amounts of tea in place of milk and malt liquors, and the consumption of incalculable amounts of the noxious and inevitable pie of the Eastern States in place of bread and nutritious puddings, will never answer the requirements of nutrition until the laws which govern that process are altered.

The American travelling in Great Britain is always struck by the large amounts of nutritious food, of malt liquors, and of the products of the dairy which are consumed, as well as by the amount of time given to their consumption, and very often he plumes himself upon the more elegant habits of his own country. In vain do we look among our women for justification for such self-congratulation, and most earnestly would we urge an imitation of customs which would greatly improve our own condition.

Habitual Constipation.—A large proportion of women who, after puberty, marriage, and maternity, suffer from uterine disease, do so in consequence of deformities of the uterus developing between the period of infancy and that of womanhood. One of the most frequent and obstinate of these is cervical anteflexion. In this state the body of the uterus does not alter its position, but the cervix is bent sharply forward, creating a stricture at or near the os internum uteri, and causing obstruction to the escape of fluids from the uterus and interference with its venous circulation. The habit of allowing large, hard masses of fecal matter to remain not only for days, but for a week at a time, in the rectum, as many women do, contributes largely to the occurrence of this deformity in the soft, pliable growing uterus of girlhood.

Alone, it is sufficient to bend the uterus and give it the shape of a gourd, but combined with pressure from above by tight, heavy clothing constricting the waist, it is not astonishing that it very often produces this common disorder of the shape of the organ. Once produced, it is a condition which pretty surely results in endometritis, dysmenorrhœa, and sterility, and it is one rarely remediable except by resort to surgery.

Let us present a picture, simple and unexaggerated in its details, of millions of our women who are exposed to the baneful influences which we have endeavored to portray: The woman is flat-chested, slightly round-shouldered, and thin almost to emaciation. Her hands and feet are cold, and her facies is not one suggestive of hilarity or buoyancy of spirit. Auscultate the thoracic organs, and a slight basic murmur will be heard over the heart, and the respiration will be found feeble and inefficient. Tell the patient to inflate the lungs fully, and the effort is so poor an one that it is seen at once that a full inspiration is a rare matter with her. She craves such stimulants as tea, and desires as food articles which are sweet. The bowels are almost invariably constipated, and an examination of the skin shows that it is inactive and that its vessels are not filled with red blood, but shrunken and atonic.

She is nevertheless in excellent health, does a large amount of work in her house, and perhaps for a long lifetime fulfils all the requirements of her existence. So she willingly allows her daughters to follow in her footsteps. And yet how thoroughly is this woman fulfilling every indication which is necessary to cause her to fall an easy prey to disease of the sexual organs as to that of any other organ in the body!

The interdependence of the various physiological processes one upon the other is very striking. Primary nutrition keeps the blood in healthy state, respiration keeps it in active circulation, and action of the muscles stimulates and makes perfect the flow through the capillary vessels of the skin, liver, kidneys, and all the other organs of the body. Derangement in any one of these processes creates disorder in others. Impoverished blood entails imperfect circulation, deficient respiratory effort furthers this, and an inactive state of the muscles tends to production of local hyperæmia by allowing blood-stasis in the deeper parts of the body. All this renders excretion inefficient, and the nerve-centres soon feel the benumbing influence of a slow toxæmia. It is evident that the influences which we have mentioned tend very decidedly to disorder the system in this way.

This completes the list of those influences which, in our estimation, most markedly predispose to disease of the female genitalia in the United States. In reviewing them we trust that we have not spoken in a tone of exaggeration of any one of them.

There are two points in this connection which we would earnestly insist upon, and concerning which we feel that the medical profession is greatly at fault. The first is the prevalent idea that there is in woman an inherent tendency to disease of the sexual organs, that she is born to these affections "as the sparks fly upward," and that an entire immunity from them is a lucky circumstance which is rather a cause for surprise. The second is the belief that, these disorders being contracted, not from avoidable but from inevitable causes, the woman herself is not responsible for them. Once falling a victim, she immediately puts herself under the care of a physician, and then very likely follows a lengthy and tedious course of local treatment.

Surely one of the highest duties of the physician is to disseminate correct views upon these points, one of his greatest derelictions endorsing them by tacit consent.

We shall deal very cursorily with the exciting causes of these diseases, for the reason already given. We would not, indeed, have alluded to them here were it not that the opportunity for enumerating them in this connection appeared to be too important a one to be lost. The chief of these may thus be tabulated:

1st. Injuries inflicted by parturition—*e. g.* laceration of cervix and perineum; pudendal and subperitoneal hematocele; and inversion of the uterus.

2d. Derangements of involution—*e. g.* subinvolution of uterus, vagina, perineum, and uterine ligaments; superinvolution of uterus; fungoid degeneration of the endometrium; retention of fœtal envelopes; displacements of the uterus.

3d. Congenital and infantile anomalies in shape, proportions, and position of genitalia—*e. g.* flexion; undeveloped state of cervix, of body of uterus, or of both; contractions of cervical canal; absence or imperfect development of ovaries; and similar imperfections of the vagina.

4th. Sudden violent and unaccustomed efforts, producing flexions, versions, and prolapse.

5th. The development of neoplasms in connection with any of the genital organs—*e. g.* fibroids or cysts of the uterus, vagina, or ovaries; adenoma, sarcoma, cancer, etc.

6th. Deposits of lymph throughout the pelvis from general peritonitis, causing displacements of uterus and ovaries; ovarian engorgement and neuralgia; congestion of all the pelvic organs.

7th. Local treatment and examination by sounds, tents, etc., causing peritonitis, septicæmia, and cellulitis.

8th. Contamination by gonorrhœal or syphilitic virus, causing endometritis, salpingitis, pelvic peritonitis, and development of syphilitic abrasions and neoplasms.

9th. Means adopted for prevention of conception and production of criminal abortion, causing endometritis, pelvic peritonitis and cellulitis, fungoid degeneration of endometrium, septicæmia, and retention of the fœtal envelopes.

CHAPTER III.

GENERAL CONSIDERATIONS UPON UTERINE PATHOLOGY AND TREATMENT.

LET us suppose that a woman, born of a mother who has transmitted to her a rather feeble constitution, lives such a life as to expose herself to enfeeblement of the nerve-power, impoverishment of the blood, and local disorders of the circulation from the predisposing causes mentioned in the last chapter. These alone are sufficient to establish in her disease of the sexual organs; or, if they do not do so, one of the exciting causes enumerated may supervene, and, falling upon well-prepared ground, the seeds of disease thus sown thrive luxuriantly. Let us consider the pathological steps by which the various pelvic diseases peculiar to her sex are developed.

Up to a recent date the subject of uterine pathology—that is to say, of the chief factors to which utero-pelvic disease may be said to be due—was in a chaotic condition, the like of which existed in none of the other departments of medical science. Theory after theory of uterine pathology had been started, more or less successfully proclaimed and defended by its originator and his disciples, only to drop back eventually to the obscurity where it properly belonged. Thus, one gentleman believed that all the diseases peculiar to females depended upon engorgement and inflammation of their sexual organs; another, that the nerves of those organs were solely at fault; a third attributed everything to displacements of the uterus; while a fourth considered the parturient process to be entirely chargeable with all subsequent disturbances. Finally, chiefly during the last twenty-five years, following the lead of our own Sims, the mechanical and surgical school have endeavored to prove that in congenital and acquired distortions, and in diseased conditions remediable only by mechanical appliances and the knife, lay the great and only truth. It seems almost unnecessary to say, in the light of our present knowledge and experience, that none of these different theories or practices are solely and entirely in the right. In our opinion, probably by far the largest number of diseased conditions of the female pelvic organs are due to the results of parturition. Following these may come the injuries produced by imprudence during menstruation, by faulty dress and pernicious habits of life, and lastly by congenital malformations and accidental circumstances over which the patient has no control. The old saying of Hippocrates was, "Propter uterum est mulier," and to a very great extent this is undoubtedly true; but during recent years the pathological changes occurring in the ovaries have attracted so much notice, and have thereby been recognized as being far more pernicious than was formerly supposed—

so frequent, indeed, that instead of "propter uterum est mulier," it might be more correct to say, "propter ovaria est mulier." In addition, the formerly insignificant Fallopian tubes have, chiefly in consequence of the discoveries made by means of the surgeon's knife, attained an importance and a rank in female pelvic pathology even equal to, if not surpassing, those of the uterus and ovaries. Besides, the peritoneum lining the pelvic cavity has, by means chiefly of this same surgeon's knife, gained a position second only to that of the three organs already named.

To begin with the uterus. In order that it should perform its functions efficiently and naturally it is essential, first, that its innervation and circulation should be normal; second, that its structure should be unaltered in character and proportions; and thirdly, that no decided and permanent change should have occurred in its position. An abnormal state developing in connection with any one of these essential conditions may derange the functional powers of this important organ, and demonstrate itself by symptoms which produce greater or less discomfort to the woman. If, as often happens, one of these conditions produces one or both of the others, and all occur simultaneously, the symptoms evoked are of course intensified and multiplied. Thus, after parturition, which may then be either premature or attended by more or less disturbance, the uterus does not return to its normal, ante-pregnant condition—remains large, soft, congested, with its mucous membrane in a hyperæmic and hypersecreting state. Gradually this heavy organ drags upon its relaxed supports, which finally give way and the uterus drops out of place; in the course of time, in consequence of the continuance of the uterine congestion, the areolar tissue between its muscular fibres is increased in quantity and becomes tough and inelastic; instead of a soft, congested uterus, we now have a hard, almost cartilaginous organ, and instead of the freely-secreting and hyperæmic uterine mucous membrane, there is an atrophic, bloodless endometrium. Now the displacement is of comparatively little importance, since the size of the uterus is so much less than at the beginning of the process. In accordance with the relaxation of one set of supports or the other, the uterus in these cases will fall downward, backward, or forward, and sometimes even sidewise, or by resting upon the floor of the pelvis the cervix may be bent and a permanent deformity of that part of the organ result. In consequence of this train of pathological conditions we may have sacralgia, bearing-down pains in the pelvis, leucorrhœa, and profuse and painful menstruation, not to mention the possibility of sterility. A frequent and now very commonly recognized primary cause of this chain of events is the occurrence of a laceration of the cervix, the truth of the statement being easily proved by the gradual restoration to health following surgical repair of the laceration and the subsequent treatment, step by step, of the other changes. Some have supposed that a displacement of the uterus in itself was a sufficient pathological change to produce decided subjective symptoms and to call for speedy relief. This belief is undoubtedly true as regards downward displacements and certain aggravated forms of backward displacement and of anteflexion, but modern, more extended observations have proved that a moderate form of anteversion or anteflexion and retroversion and retroflexion do not of themselves produce decided physical disturbance, but that the frequently accompanying congestive enlargement and catarrhal condition of the endometrium are the real causes of the discomfort experienced by the patients. We believe that in the order of their frequency and importance the following primary pathological conditions must be considered to constitute the especial factors of uterine disease:

1. Catarrhal inflammation of the lining membrane;
2. Prolonged congestion of uterine tissues;
3. Excessive growth of connective or muscular tissues.

The first condition may be found in the virgin, in the married nulliparous woman, and in the woman who has borne children. It may be the result of exposure to cold, of sudden arrest of menstruation, of overexertion, in the virgin; of the same causes, with that of excessive coition added, in the married nullipara; and of subinvolution, too early rising, laceration of the cervix, in the parous woman.

The second condition follows more or less closely upon the first, depends upon similar causes, and is intimately connected with them.

The third condition is merely the last link in the chain, and the natural consequence of a long continuance of the first two.

Whatever tends to produce and maintain any of these three primary conditions is likely to establish confirmed uterine disease.

We will briefly review more in detail the individual agencies which ordinarily induce such a result:

1. As we have already stated, in a very large majority of cases of uterine disease the first link in the morbid chain is subinvolution, which produces as direct consequences passive congestion, hypersecretion of the lining membrane, profuse menstruation, displacements, sterility, and interference by pressure with neighboring organs.

2. A large number of cases arise from primary catarrhal inflammation of the lining membrane of the uterus itself; beginning with this, there follows a hyperplasia of uterine tissue, displacements, menstrual disorders, and sterility.

3. Disease not only of the neck, but of the body, and not only of the mucous membrane, but of the tissue proper of the organ, is often induced by laceration of the cervix, which results in eversion and the exposure of the tender cervical mucous membrane to friction and injury during coition and exercise.

4. The development of benign or malignant growths, consisting of hyperplasia of one or more of the uterine elements, often changes the innervation, circulation, form, and size of the uterus and results in displacements, menstrual disorders, leucorrhœa, pelvic pains, mechanical interference with surrounding objects, and, in the case of malignant disease, a fatal issue.

5. In a certain number of cases undoubtedly displacement of the uterus results in passive congestion, hypergenesis of tissue, dysmenorrhœa, endometritis, and sterility.

6. As the result of acute flexion of the uterine canal the circulation of the organ is in some cases interfered with, passive congestion takes

place, and dysmenorrhœa ensues. Whether this dysmenorrhœa can be called congestive or obstructive is still a matter in dispute. We believe that while a uterine canal may not in the intermenstrual period be so flexed as to prevent the exit of blood, still, that in the hypertrophic condition of the endometrium natural to the inception of menstruation, for the time being the swollen mucosa may prove a temporary obstacle to the exit of the flow, and thus cause an obstructive dysmenorrhœa.

7. Under highly neurotic conditions of the whole system painful menstruation may occur, which is not in itself due to any pathological change in the uterus distinguishable by a physical examination. These are the so-called cases of neuralgic dysmenorrhœa.

8. The uterine canal may be either so much narrowed or entirely closed as the result of congenital deformity or subsequent disease as to prevent the free exit of secretions and blood from the uterine cavity, and thus painful menstruation, inflammation of the lining membrane of the uterus, hæmatometra, and possibly regurgitation through the Fallopian tubes, may ensue.

9. Compression of the uterus may occur by large exudations of plastic material in Douglas's pouch or in the pelvic cellular tissue, in consequence of which the circulation of the uterus is obstructed and a bloody flow from the organ may take place, although it is not in itself diseased.

10. In consequence of a general deranged state of the nervous system the genital organs may be kept in a condition of congestion and hyperæsthesia, such as vaginismus, pruritus, and nymphomania, so as to simulate actual disease of those organs, or fissure of the anus or an inflamed bladder may exert a like influence upon the other pelvic organs.

Any one of the above-named pathological conditions may exist alone in a given case or be associated with one or more of the others. Among the conditions which are commonly associated are subinvolution, chronic endometritis, displacement, profuse or painful menstruation. To find malignant disease of the uterus combined with fibroid growths is unusual, although a carcinome of the cervix, together with a fibroid of the body of the uterus, has been occasionally observed. In the great majority of cases in which uterine disease has existed for a greater or a lesser length of time the following conditions will usually be found present:

1. The uterus will be larger than normal; that is, either subinvoluted or hyperplastic.
2. A chronic catarrh of the endometrium exists.
3. The uterus will be displaced.
4. More or less laceration and eversion of the cervix is found.
5. The ovaries and tubes will be more or less sensitive and enlarged.

According as one or the other of these physical signs predominates the symptoms will vary and the treatment will need to be directed particularly to it. In former years a great deal was taught and written about ulceration, granular erosion, and inflammation of the cervix uteri. Since the discovery of Emmet that the above conditions, at least in the parous woman, are due almost exclusively to a parturient laceration of the cervix, the causes, significance, and treatment of these lesions have been properly appreciated. We must not overlook the fact, however, that erosion of the lips of the cervix in a virgin or nulliparous woman is a common result of chronic endometritis, both corporeal and cervical.

The disease known to the older writers by the name of chronic metritis is nowadays no longer recognized as an inflammation; in fact, such a pathological condition as a chronic inflammation does not exist: clinical, macroscopical, and microscopical investigations have demonstrated that the so-called chronic metritis is merely a gradual formation of new intermuscular cellular tissue, produced by the persistence of venous hyperæmia and aggravated by the regular menstrual engorgements. Subinvolution of the uterus must necessarily be considered the most frequent starting-point of this so-called areolar hyperplasia. While this disease is in no sense dangerous or productive of any more than comparatively trifling discomforts to the patient, it is still of such frequent occurrence that we have thought it worth while to refer to it in this brief discussion of uterine pathology. We do not pretend to deny that an acute inflammation of the non-puerperal uterus may at times gradually develop the same subjective and physical signs as are found in areolar hyperplasia following subinvolution, but this occurrence is, in our experience, so rare that we could almost number the cases on our fingers.

Ovaries and Tubes.—The normal physiological recurrence of ovarian congestion every four weeks as a premonition of the menstrual flow, if in any way arrested or interfered with, will produce a passive congestion, and ultimately a hyperplasia, of the stroma of the ovary. Any sudden or particularly active interruption of ovarian activity may produce even an acute inflammation of that organ. As the result of such interference pain more or less acute, more or less constant, may exist in the ovarian region, and the ovaries may gradually become enlarged, exquisitely tender, and may prolapse behind the uterus so as to be subject to injury during coition and defecation. Further, a continuance of periodical ovarian congestion may result in the gradual enlargement of the Graafian follicles and the ultimate production of ovarian tumors. Besides the local effects of the influence above named, the diseased conditions of the ovaries may make themselves felt in more or less distant organs by means of what is known as reflex action upon the nervous system; thus an inflamed ovary may produce directly an irritable stomach, a hemicrania, a submammary neuralgia, and various other nervous symptoms. Painful and profuse menstruation may also be a result of ovarian congestion or inflammation.

In consequence of any cause which may produce a catarrhal inflammation of the lining membrane of the uterus, the same membrane extending into the Fallopian tube may become involved, and catarrhal salpingitis with its significant pain and probable production of sterility may ensue later on; the catarrhal inflammation may assume a purulent character; the tube may become hyperplastic in all its elements; its purulent discharge may ooze out of the infundibulum; and a plastic peritonitis with adhesion and probable closure of the tube will take place. Finally, a gradually increasing accumulation of pus may occur in the tube, dilating it to many times its normal dimensions. In place of the pus clear serum or a bloody fluid may distend the tube. With the pathological conditions of the ovary and tube just mentioned it is obvious that sterility must simultaneously exist.

Peritoneum.—Chiefly as a result of the tubal diseases above mentioned the peritoneum lining the pelvic cavity becomes inflamed, its adjacent folds agglutinated, and more or less firm adhesions form between them and the ovaries and tubes. Besides, large exudations of serum and plastic lymph occur, as the result of acute inflammation, into the pockets and recesses of the pelvic peritoneum, forming more or less appreciable and distinct masses which interfere with the normal mobility of the uterus and appendages, and ultimately are either absorbed or go to suppuration, or leave behind them indubitable traces of their preexistence in the shape of adhesions and distortions of the pelvic organs. The importance, therefore, of the pelvic peritoneum as a factor in the production of sexual disease in the female is clearly demonstrated.

Pelvic Fascia and Ligaments.—Chiefly as the result of parturition, especially if difficult or frequently repeated, injury or relaxation of the pelvic fascia and ligaments is sustained, and in consequence of the absence of support given by these tissues to the uterus, bladder, and rectum, a dropping of these organs frequently takes place, and we find bladder, uterus, and rectum, either one or the other, individually or all together, loosened from their normal attachments and more or less prolapsed. If in addition the superior supports of the uterus—namely, the folds of peritoneum known as the broad, retro-uterine, and vesico-uterine ligaments—are relaxed, nothing is in the way to prevent a complete extrusion of the organs occupying the pelvic cavity.

Prognosis in Uterine Affections.—There is no organ of the body the diseases of which offer greater difficulties in prognosis than those of the uterus. So much depends upon the habits of the patient, the injurious influences to which she is exposed, and the faithfulness with which she follows out the directions of the physician that often very little can be predicted, very little promised with any certainty. The error into which the incautious practitioner is most likely to fall is that of predicting a cure at too early a period, and fixing some definite time for its accomplishment. The patient may declare that she and her friends will be satisfied even if the limit be fixed not by months but by years; nevertheless, she is desirous of knowing *when* she may confidently expect a cure. The answer to this question, not in the lesser interest of the practitioner, but in the greater one of the patient, must often be that no such time can possibly be determined upon. In some cases it becomes necessary to state further that not only is the time, but the certainty, of complete cure doubtful—that local treatment will cause pain, may result in danger, and may absolutely aggravate the existing symptoms.

Another point which influences prognosis is this: in the management of uterine diseases it is of primary importance that the practitioner should enlist the interest and co-operation of his patient. Should she be apathetic with regard to the result, or even, having begun treatment with enthusiasm, become disaffected from any cause, his duties will probably prove irksome, annoying, and fruitless. For this reason he should be cautious in urging with too great earnestness the adoption of local treatment.

In view of this, and the additional fact that treatment may extend over months before a cure is effected, the physician should avoid all resources which by their uncleanness or disagreeable nature may disgust a refined patient or make her rather willing to bear her disease than the means adopted for its cure. If such means will be very likely to give relief, they should of course be employed; but if, as is the case with many of them, their efficacy be extremely doubtful, they should not be insisted upon. For example, to give an exaggerated illustration, if a lively, fastidious lady were called upon, for the relief of an endometritis which is not in itself very annoying, to forego society and spend most of her time in bed, to fill the vagina daily with a semi-solid mass of powdered linseed after the method of Mélier, to rub mercurial ointment over the hypogastrium, and have a weekly application of leeches around the anus, she would probably in time get tired of the treatment and lapse into the very state of apathy to which we have alluded.

There is one class of cases in dealing with which we should especially recommend that perfect frankness be observed. It may be represented by a patient who has been persuaded by husband, mother, or friends, contrary to her wishes, to submit to treatment. She utterly repels the course to be adopted, is sure that it will do her no good, is unwilling to fulfil the directions left her for daily guidance, but yields under the assurance of her advisers that the treatment will be free from discomfort, give no pain, and will surely cure her in a few weeks. The physician, for the sake both of his patient and himself, should avoid joining in this deception. Stating the facts fully to her, telling her of the danger which neglect will involve, and of her duty under the circumstances, he should appeal to her reason, and decline to take charge of her case until she really desires his services.

Reasons for the Frequency of Failure in the Treatment of Uterine Diseases.—That some uterine affections of non-malignant type are incurable cannot be denied; but even putting these out of consideration, the fact is notorious that the local treatment of these diseases is not as successful in its results as we could wish. We now propose an investigation into the causes of this want of success. It appears to us that the most apparent and most constant of them may thus be summed up:

Imperfect diagnosis;
Erroneous prognosis;
Inefficient or inappropriate therapeutics;
Inattention to general management.

Imperfect Diagnosis.—It is not rare to meet with instances in which physicians have, for months, treated cases of uterine disease concerning the nature of which they not only did not have a correct theory, but had no theory at all. Under these circumstances the most general practice formerly was to pass, about once a week, a solid stick of nitrate of silver up to the os internum—not to cure cervical endometritis, for that has never been suspected, but to do the best one can in the way of treatment when he does not know the nature of the disease which he treats. We have no inclination to attribute this always to any intentional laxity of morale, but rather to indecision and aversion to creating a disagreeable issue with the patient. It is, however, impossible to deny the fact that such a course will sometimes be pursued by those who in the case of a diseased eye or inflamed knee-joint would not hesitate to confess, with the utmost frankness, their uncertainty and need of assistance. With uterine as well as all other diseases the diagnosis must be properly made before treatment can prove curative; and in this field of practice, fully as much as in others, honesty and sincerity should guide the practitioner. He who practises deception here is surely no less culpable, although far more likely to escape detection, than the charlatan who makes it a rule of life.

It is a matter for congratulation to the medical profession, as well as to poor, suffering women whose health and happiness are at stake, that year by year general practitioners are either acquainting themselves more thoroughly with the details of pelvic disease in the female, or, recognizing their inexperience and want of skill, are acquiring the habit of taking such patients to specialists, in whose hands they can safely place their patient if they themselves do not feel competent to carry out the directions received from the consultant. The field of medicine has now grown so large that it is impossible for any man to master completely every one of its departments. The "universal specialist" is, in fact, an impossibility; hence Medicine has necessarily been divided into numerous specialties, each of which forms the life-study of a certain number of physicians, who, of course, are much more competent to diagnose and treat diseases coming into their specialty than any general practitioner can possibly be. True specialism, as it now exists, and very properly so, is a creation of the last twenty-five years, and chiefly since then have the greatest advances been made in medical science.

Erroneous Prognosis.—Even if the diagnosis and treatment be correct, an erroneous prognosis as to time of cure may so sap the confidence of the patient as to send her to other counsel. And now she may run the gauntlet of theories and therapeutics. Her first attendant having recognized endometritis with resulting displacement, the second may treat the displacement alone as the origin of her symptoms. Passing into the hands of a third, she may be told that to check her profuse leucorrhœa would be to cure her disease, which the fourth might contradict, with the assertion that the uterine disorder was only a complication of oöphoritis, which was the fountain of all her difficulties.

Inefficient or Inappropriate Therapeutics may cause failure in cure even when a proper diagnosis and prognosis have been made. At times a course of local alteratives may be persevered in when the disease demands more general treatment. At others it is necessary to extend treatment into the cavity of the body, and not of the neck alone; and at others, still, to perform a trifling surgical operation to remove a difficulty which, unless removed, may keep up the disease indefinitely.

The best results in the management of these affections will not follow a direct resort to treatment of the most prominent existing disease, but will very often be obtained by removal of its cause or the alleviation of its complications. Let us make our meaning clear by some examples. The physician examines and finds endometritis to exist with its usual symptoms, leucorrhœa, pain, menstrual disorders, etc. This affection may be the result of an antecedent displacement. If it be so, replacing and retaining in position the displaced organ should be the first step in treatment, as it was the first step in diseased action. Again, a patient has menorrhagia and prolonged menstruation, with a long, contracted cervix uteri. Obstruction to the ready escape of menstrual blood often so alters the lining membrane of the body of the uterus as to create these disorders. If the physician treat the symptom, he will surely fail in curing it, while success will attend his efforts if he remove the obstruction which prevents the uterus from emptying itself.

So also with the complications which are excited by uterine disorders. A patient is affected by cervical endometritis that in time produces hyperplasia, which by increasing uterine weight displaces the uterus. That organ, lying upon the floor of the pelvis, is injured by locomotion and coition, its lower segment is bathed in purulent leucorrhœa, and great pelvic pain annoys and harasses the patient. If the practitioner expects to cure her, let him, at the same time he treats the primary disease, the endometritis, relieve a set of complications which, unless removed, will cause repeated relapses as often as he approaches the accomplishment of his end.

One more example may be cited before concluding these remarks. A displacement of the uterus exists, and the practitioner knows that it has been due to one of two influences—either increase of uterine weight or loss of uterine support. Which was primary he cannot determine, for at the time of his examination both exist. To effect a cure it would be the part of wisdom not to limit treatment to one, but simultaneously to treat both by giving artificial support and diminishing uterine weight. Without being able to say which is the original disease and which the complication, he should endeavor to relieve both at the same time. And here, unfortunately, the patient is liable to come in contact with the personal prejudice of her attendant; he does not approve of pessaries. Why? Because he has seen them do great damage! Yet he does approve of splints, of the catheter, of anæsthesia, and of opium! Very likely he has not given an hour to the investigation of this important subject in his whole professional career. How often do patients come to those specially treating these diseases, after years of treatment from such prejudiced practitioners, with anteversion, retroversion, or slight prolapse, and, obtaining immediate relief, ask in surprise the significant question, Why was this not done long ago?

Every man is loath to acknowlege incapacity to patients who believe him to be possessed of all medical science; and in some of these cases for years the patient is allowed to bear suffering, inconvenience, and expense by reason of the vanity and incompetency of her physician.

Until a few years ago surgical gynecology was a new departure, and, being frequently overdone, was of course subject to much severe and hostile criticism. In certain particulars the criticism may at present still be justified, but, all in all, the marvellous achievements of surgery in gynecology within the last decade have triumphantly swept away all opposition, and to-day, to be a gynecologist fully abreast of the requirements of the times, means to be an accomplished, a skilful, and a daring surgeon. Millions of women, who twenty years ago were allowed to go on suffering under tedious palliative treatment, have since been cured by the skilful and rational use of the knife, and probably the end is not yet.

Inattention to General Management and Hygiene.—The statement which we often meet with, that the majority of the cases of uterine disease require no local treatment whatever, is a fallacy, based either upon strong prejudice against one of the most important modern improvements in medicine or upon want of experience in such cases. But too much stress cannot be laid upon the advantages to be derived from constitutional treatment and the general management of these cases. We too often fail to insist upon rest, cessation of marital intercourse, quietude after applications to the uterus, and other points, a neglect of which may exert a powerful influence for evil and frustrate the effects of all that is done by local means.

Every one who has had experience in the treatment of these disorders must have been struck with surprise at the wonderful improvement exerted upon cases which have long resisted local means, by a sea-voyage, a visit to a watering-place, a course of sea-bathing, or a few months passed in the country. Not only is this improvement manifest in the general state of the patient; it shows itself locally also, and in some cases complete recovery may be thus attained.

It should not be forgotten by the gynecologist that chronic local disease is often caused by a general depreciation of the system. In some cases the lungs undergo chronic consolidation, which often goes on to phthisis; in others chronic corneitis or granular lids occur; while in others still cervical endometritis marks the altered constitutional condition. When such a result takes place the two states continue to react one upon the other. The depraved system increases the local disorder to which it has given rise, and the irritation, kept up by the latter, aggravates the degree of the former. This being true, it would evidently be irrational to treat one of the two existing pathological conditions without having due regard to the other. Some cases of endometritis, however, occur in women who are apparently in good health, and are usually the consequences of parturition or abortion. But cervical, and even corporeal, endometritis, the latter of which may go on to villous degeneration, will generally be found to have engrafted themselves upon a depreciated system.

CHAPTER IV.

GENERAL CONSIDERATIONS UPON SOME OF THE MOST IMPORTANT THERAPEUTIC RESOURCES OF GYNECOLOGY.

It is not our intention to devote a chapter here to the general consideration of the ordinary therapeutical resources of this department, but, as some of the most important of these should be especially considered and described, we prefer to do so here, rather than scatter them in a desultory manner throughout the work, where some of them might escape notice.

At the same time that the judicious practitioner should avoid routine, he should not allow himself to confound in his mind the two terms "routine" and "system," and, while no two cases should be treated exactly alike, a general plan will apply with greater or less exactness to many.

General System of Diet and Exercise for Restoring the Depreciated Nerve- and Blood-state ordinarily attendant upon the Pelvic Diseases of Women.—As a rule, these cases require a general tonic plan of treatment. There are, however, a few exceptions to the rule, such, for example, as cases in which the neurasthenia and spanæmia so universal as consequences have not as yet arisen, because the patients have not been long exposed to the pathological condition.

The following are the directions which we give to patients for a general plan:

1. While you are under treatment remember that a great deal will depend upon your cordial co-operation and intelligent endeavor to carry out instructions.
2. Eat fresh animal food three times a day, and as much other nutritious food, such as bread, crushed wheat, potatoes, rice, eggs, etc., as you can.
3. Between breakfast and the mid-day meal, the mid-day and evening meal, and upon retiring at night, drink a tumbler of milk or a teacupful of beef-tea or of mutton or chicken broth.
4. Every morning upon rising, and every night upon retiring, take a sponge-bath of warm water strongly impregnated with table salt, about a teacupful to an ordinary basin of water. Then rub thoroughly and briskly with a rough towel: the knitted tape towel is the best.
5. After each bath exercise for ten minutes briskly with dumb-bells, the rowing-machine, or light calisthenic rods, breathing during this time freely and as deeply as possible.

6. Endeavor to sleep for nine hours every night and for one hour at mid-day every day remove the outer clothing, lie quietly in bed, remain entirely without occupation, and if possible sleep.

7. Have an action by the bowels once in every twenty-four hours. If constipation exists, take a tablespoonful of this prescription every morning on waking in a half tumbler of cold water:

℞.	Magnesiæ sulph.,	℥iv;
	Ferri sulph.,	ʒss;
	Acidi sulph., dil.,	ʒij;
	Aquæ,	℥xvj.—M.

8. During menstruation keep very quiet, and at all times avoid violent muscular exertion and fatigue.

9. Use every night and morning a copious vaginal injection of very warm water, by the method explained to you.

10. Be sure that the clothing be loosely worn, and that all weight of skirts be carried upon the shoulders and not upon the hips.

It is tiresome for a practitioner, seeing a large number of new patients daily, to repeat these directions to each. He is very apt too, even if willing to assume the labor, to forget some of them, and even if he do not the patient is very sure to do so. It is therefore very useful to have them printed upon a slip of paper, so that a copy may be carried home for reference and future guidance.

Of course, in addition to these, special cases will require particular prescriptions and directions as to use of stimulants, etc. If the patient is to wear a pessary too, we are in the habit of giving another list of directions having special reference to the management of this, which will be given in connection with that subject.

Pessaries.—Uterine pessaries hold a prominent position among surgical appliances as a means of procuring palliative and curative results. Like all other mechanical means which are powerful for good, they are capable of doing some harm. Their injurious consequences we would attribute, however, not to the instruments themselves, but to the improper manner in which they are very often used, and the carelessness with which they are allowed to remain *in sitû* without observation. If splints were applied to broken bones and never examined until union was effected, their utility would soon become doubtful. Pessaries should be carefully watched, for they sometimes create cellulitis, peritonitis, and vesico-, recto-, and utero-vaginal fistulæ. In some cases they have been known to pass completely out of the vagina into the rectum or bladder. Some years ago a case entered the service of Prof. L. A. Sayre of the Bellevue Hospital Medical College, presenting very obscure symptoms of uterine disease. Examination proving that some foreign substance existed *in utero*, Prof. Sayre dilated the cervical canal, and extracted a globe pessary which had migrated from the vagina into the uterus, and been retained there for a length of time.

Whatever pessary be employed, it should sustain the displaced uterus without creating pain or discomfort. Should any such inconvenience be produced, it should be at once removed, for the most violent cellulitis and peritonitis may result. While a pessary is kept in the vagina, cleanliness should be secured by daily vaginal injections, and at intervals, not exceeding two months, it should be removed, examined, and reintroduced. At such times a specular examination should always be made, since possible erosions produced by the pessary cannot be detected by the finger alone.

One of the difficulties attending the use of these instruments in general practice unquestionably arises from the fact that a great deal of experience is necessary before any one can use them with certainty of accomplishing good results. But another is due to the practitioner having only a small supply from which to choose. He who habitually employs these articles should have at his disposal a large and varied assortment, and should possess sufficient mechanical ingenuity to mould and adapt them to the special requirements of cases which may present themselves. The vulcanite pessary may be given any shape after being heated, and metallic ones may be readily moulded by the fingers.

Whether a suit for malpractice has ever arisen on account of injury done by a pessary we cannot say, but we can easily imagine such a source of litigation. Every practitioner should bear in mind that injury done by a pessary does not argue ignorance on the part of its introducer. When one removes, as every gynecologist must often do, a pessary from a position in the pelvis in which it has become imbedded, and finds, as its result, a ragged, ulcerative tract existing, he is very apt hastily to conclude that the instrument was improperly applied. This is by no means always true. We have repeatedly removed pessaries under these circumstances which had been introduced by the most competent gynecologists. How common it is to find a pessary which one has carefully introduced turned completely upside down at the end of a week! The migratory and evolutionary performances of the vaginal pessary are truly wonderful. These facts being recognized and admitted by all, the evident deduction is that it is unjust, as it is unprofessional, to expose to a patient, at the expense of an absent colleague, every lesion which these difficult instruments have created. To tell a patient that the instrument she wears has made a deep ulcer in the vagina is to tell her that her attending physician has been guilty of a gross blunder; for "ulcer," in the popular mind, means anything that is frightful in the way of lesion, from erythema to carcinoma. And, although the statement is literally true, he who makes it knows that the same accident has happened to himself many times, that a week of rest will entirely efface it, and that no real damage has resulted to the patient from its occurrence.

In spite of all its attendant evils, the use of the pessary is, as we have said before, one of the most important points in gynecology, and every practitioner of that art should make it a faithful, special, and constant study. We confess that when we are told, as we sometimes are by physicians, that they never use pessaries, because they are so strongly prejudiced against them, the question always arises in our mind, Then how and why do you treat uterine diseases? How pessaries can be dispensed with is to us one of the unfathomable mysteries of gynecological practice. And why any one should practise an art and ignore a means which, properly mastered, constitutes one of the most powerful and reliable of its resources, is equally incomprehensible.

We think it an excellent plan for the physician who has inserted a pessary to give to the patient some such written directions as those which follow, urging her, in case of trouble from the instrument, to refer to and closely abide by them:

1st. You are wearing a pessary. If it give you pain, pass your finger into the ring which you will feel and draw it away. Do not mind a little discomfort in doing this, but do it without fail.

2d. If after this you suffer pain, go to bed and send for a physician.

3d. Every night and morning douche the vagina thoroughly with from two to four quarts of hot water, using a fountain syringe and a douche-pan specially designed for the purpose. The water should be as warm as you can comfortably bear it.

4th. Wear your clothing as loosely as possible, using "skirt supporters," and not wearing tight corsets.

5th. Keep the bowels regular, securing one action every day.

6th. Avoid, as much as possible, going up stairs, lifting heavy weights, using the sewing-machine, and riding in a rough vehicle.

7th. Lie down for an hour at mid-day every day, and keep very quiet at menstrual periods.

8th. Remember that attention to these directions will have an important influence on your recovery.

Precautions to be Uniformly Observed in Operations upon the Sexual Organs of the Female, for the Prevention of Septic Infection.—One of the greatest achievements of modern pathology has been the discovery of the agency of certain families of lowly-organized fungi and micrococci in the production of diseased states which the humoral pathology of the olden time had traced to the blood. Although the subject, born only twenty years ago, is still in its infancy, a great deal has already been accomplished in reference to it, and it is not too much to hope that the path has been struck which is destined to lead to an elucidation of the causes of contagion and infection. Those who were chiefly instrumental in establishing our knowledge upon this point are Virchow, Rindfleisch, Recklinghausen, Hueter, Vogt, Klebs, and, of recent years, Pasteur and Koch.

The experiments and observations on the origin, growth, and dissemination of the various fungi and micrococci which are supposed to produce many infectious and contagious diseases, such as septicæmia, diphtheria, scarlet fever, yellow fever, cholera, etc., have been mainly carried on with the thoroughness and perseverance peculiar to that race in the laboratories of the German universities. While this whole subject may still be said to be more or less unsettled, and while in our minds it is still a question for future investigations permanently to decide (to put it, perhaps, a trifle strongly) whether the germs produce the disease or the disease the germs, still, the very recent observations of Pasteur and Koch would seem to indicate that some diseases at least are directly produced by certain noxious principles which, once introduced into the system, grow and spread and are transmissible to other living bodies. Although the germ theory had been foreshadowed for some time previously, it is chiefly due to the antiseptic teachings and practice of Sir Joseph Lister that attention was so forcibly drawn to the dangers incurred by every person afflicted with an open wound in contact with a vitiated atmosphere or with unclean instruments, fingers, or dressings. His device was to protect the open wounds by a spray of carbolic acid, under which all operating and dressing was performed; hands, instruments, sutures, dressings were all cleansed and immersed in a similar solution of carbolic acid. The results obtained were wonderful, and wounds healed by first intention, the like of which formerly in the same wards had either suppurated or become actually septic. In the course of time original and progressive minds came to the conclusion that as carbolic acid was, after all, not a real germicide, something else than this chemical agent must be the reason for the immunity from septic infection achieved by Lister's method; and in the course of their investigations they chanced upon an agent which, while in large doses a violent poison, is in weak solutions a powerful germicide—namely, corrosive sublimate, which in a solution of 1:10,000 is found to destroy the vitality of the bacteria, which thrive in even strong solutions of carbolic acid. Hence, during the last ten years solutions of the bichloride of mercury of varying strength have been the sheet-anchor of all surgeons who wish to be perfectly sure against the septic infection of their patients. On acccount of its possible toxic effects if absorbed too freely by the system where large wounded surfaces are to be brought in contact with the agent, solutions not stronger than 1:5000 are now used. The hands of the surgeon, however, are usually immersed in a solution of 1:1000 as often as may be required during an operation; and instruments, because they are tarnished by sublimate, are kept in a 3 per cent. solution of carbolic acid. Some of our most progressive surgeons contend that the use of poisonous germicides is entirely unnecessary, and that simple boiled or distilled water, with perfect cleanliness of hands, instruments, dressings, sponges, and everything connected with operator and patient, amply suffices to prevent septic infection. We admit the probable correctness of this view; at the same time we have thus far felt that absolute security was best attained by impressing upon the minds of assistants and nurses the scrupulous observance of strict antiseptic rules governing the use of poisonous solutions. Distilled and boiled water *may* be thoroughly sterilized, but by standing it may again become infected. A solution of corrosive sublimate, even if very dilute, whether freshly prepared or not, always retains its germicide properties. Of course, in no instance should such a poisonous solution, no matter how dilute, be freely poured upon so large an absorbent surface as the abdominal cavity. When it is necessary to wash out the abdominal cavity, we use either warm boiled distilled water or a solution recommended by Thiersch containing 8 parts of boracic acid and 1 of salicylic acid to 1000 parts of water. Unquestionably, the essence of Lister's teachings and of the present practice of antisepsis is the scrupulous observance of *cleanliness* in everything connected with the surgeon, the patient, and her surroundings. These principles are now so well understood and so universally accepted that even in the crowded hospitals septic infection is a rare occurrence, and where formerly whole wards would be infected with septicæmia, pyæmia, hospital gangrene, and prolonged suppuration, at present even the largest and most exposed wounds heal without rise of temperature.

Let the gynecological surgeon keep constantly before his mind the fact that uncleanliness goes hand in hand with bad, and cleanliness with good, surgery. Simple as this agency seems, it is the sole one upon which rests the greatest advance of modern surgery. Emmet says, truly, "Many a woman's death-warrant is carried under the nails of her surgeon." Many years ago a humorous medical writer, half in jest, elevated the tongue-scraper to a place of dignity in the treatment of dyspepsia. The nail-brush, in serious earnest, deserves such a position as a prophylactic of lymphangitis and septicæmia.

The following rules should always be observed in operating on the female genitalia:

1st. Before and after every operation wash all instruments in very hot carbolized water, and during every operation keep all instruments immersed in carbolized water. Sutures and ligatures, if of silk, are boiled in a dilute solution of corrosive sublimate, and kept immersed in the same until used. Catgut is soaked in oil of juniper and preserved in alcohol. Silkworm gut is treated in the same manner as silk.

2d. In all laparotomy operations observe scrupulously the directions given for sterilizing instruments, sponges, dressings, as well as clothes and hands of operator and assistants. The carbolic-acid spray introduced by Lister is no longer employed.

3d. Always bathe denuded surfaces both before and after apposition by suture with a solution of 1 : 10,000 of corrosive sublimate.

4th. Always destroy sponges used in an operation which admits of the possibility of their being contaminated by septic fluids, and when they are employed a second time always have them boiled in a solution of bicarbonate of soda, then immersed in a weak solution of permanganate of potash, and preserved in boiled carbolized water.[1]

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[1] *Methods of Sterilizing Gauze, Sponges, Silk, Silkworm Gut, and Catgut, in use at Mt. Sinai Hospital.—Gauze:* Wide-mesh cheese-cloth. Any dry-goods store, at about three and a half cents a yard. Cut into convenient pieces. Then take one pound of common soda to twenty yards of gauze, and sufficient boiling water to cover. Leave in this solution twenty-four hours. Wring, wash in cold water. Then for forty-eight hours in bichloride 1 : 1000. Wring, dry, fold.

For carbolized gauze use 5 per cent. carbolic in place of the bichloride.

Iodoform Gauze: Take Iodoform, ʒss;
Glycerin, ℥ss;
Bichloride sol. (1 : 1000), gt. j.

In this mixture soak 10 yards of bichloride gauze prepared as above, wring, and then fold.

Silkworm Gut and Silk: Boil for two hours in 1 : 500 bichloride. Keep in 1 : 1000 bichloride (alcoholic) sol. Silkworm gut may be reboiled any number of times.

Catgut: Common commercial catgut. In ether twenty-four hours, changing the ether three times. Then forty-eight hours in 1 : 100 bichloride sol. (alcoholic). Keep in 95 per cent. alcohol.

5th. After all operations upon the uterus, douche the vaginal portion of the organ with carbolized water, and if hemorrhage is apprehended, tampon tightly for twenty-four hours with antiseptic cotton. This being removed, syringe the vagina with carbolized water at short intervals (two or three times daily).

6th. After operations on the pelvic organs, irrigation of the vagina with carbolized warm water is required only if there is a discolored or offensive discharge. It is well to prevent the introduction of septic germs from without by covering the vulva with a pad of sublimate gauze, which is to be changed as often as soiled.

7th. If absolutely necessary after operations, give morphine hypodermically to quiet pain and nervous excitement; but avoid doing so if at all posssible after laparotomies.

8th. Before all grave operations, if the patient is weak or anæmic, give an ounce of whiskey and ten or fifteen grains of quinine.

9th. Before every operation let the operator and his assistants cleanse and disinfect not only the part to be operated, but also their own hands and arms, in order that every possible suspicion of septic infection may be removed.

10th. As a rule, avoid even trivial operations, unless good reason for doing otherwise exist, for a few days before and after menstruation. Still, we have repeatedly performed laparotomy on patients who began to menstruate unexpectedly on the day fixed for the operation, or in whom menstruation came on immediately after the operation, and have in no way found recovery retarded by the coincidence. We have merely used the precaution of keeping the vagina sealed as hermetically as possible by a sublimate gauze pad over the vulva.

While undoubtedly many wounds heal promptly under the most unfavorable circumstances, there can be no doubt that, chiefly in large hospitals, a careful observance of the above rules will result in an almost complete immunity from septic infection. Whether these splendid results are due to the employment of germicide agents, or whether they are to be attributed to the scrupulous cleanliness and attention to minute details in the dressing of wounds which are the outcome of modern antiseptic practice, we do not pretend to say: the fact remains that since the promulgation of Lister's doctrines a complete revolution, to the great benefit of patient and surgeon, has taken place in the management of wounds and in the results achieved by surgery. The surgeon who nowadays would omit the antiseptic precautions briefly detailed in the foregoing lines would be justly considered far behind the times and culpably neglectful of the best interests of his patients.

Even in ordinary examinations of the uterus the antiseptic idea should always be kept in mind. The plan which we follow, there-

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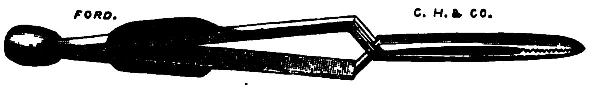
Prepared Rubber Tissue: Cut into strips and wash in 1 : 1000 bichloride. Keep in same solution.

Sponges: Common Florida. $1.20 a pound by bale (about one cent a piece); used only once. Wet with water to expand; then dry. Beat thoroughly with mallet. Hydrochloric acid 8 per cent. for eight hours. Wash in cold water; wash in warm soapsuds (green soap ½ pound to water 1 gal.); wash in cold water to clear of soap. Keep in carbolic 5 per cent., changing every four weeks.

(*Furnished by Dr. Southgate Leigh, House Surgeon.*—P. F. M.)

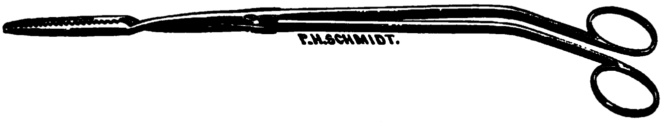
fore, is this: Every day our office-nurse pours boiling water upon all the instruments ordinarily employed, such as speculum, probe, sound, tenaculum, depressor, etc., washes them carefully with soap, and rubs them bright with sapolio. They are then kept immersed in carbolized water during examinations. After every examination the instruments used are again washed with soap, rapidly rubbed bright, and immersed in a fresh supply of carbolized water. After every examination the examiner's hands are carefully washed with soap in very warm water, the nail-brush freely used, and just before another examination they are rinsed in the carbolized water in which the instruments are brought in. The fingers and all instruments introduced either into the vagina or uterus are lubricated with carbolized vaseline, carbolic soap, or soft soap thoroughly carbolized. In these examinations absorbent cotton, held in a pair of dressing-forceps like those shown in Figs. 2 and 3, should be made to replace sponge, which is so much more likely to carry contagion from one patient to another.

FIG. 2.



Thomas's Dressing-Forceps.

FIG. 3.



Mundé's Uterine Dressing-Forceps.

That patients are at times injured by want of proper hygienic precautions on the part of physicians we feel assured by personal observation. That the contamination of women through their criminal ignorance or carelessness is not much more frequent is a matter of unceasing amazement to us. Every gynecologist should feel two things very sincerely with reference to his daily systems of examinations: 1st. That he would be willing to have his own female relatives exposed to all the risks of contagion to which he exposes his patients; and 2d. That he would at any time willingly submit his methods to the critical investigation of a jury of his peers as far as concerns cleanliness and hygiene.

After operations where it becomes necessary to have the bladder evacuated by the catheter the precaution should always be observed of dipping the catheter in carbolized water and smearing it with carbolized oil or vaseline before its introduction. A neglect of this often results in prolonged vesical trouble which might readily have been avoided. A further useful precaution is to have the vestibule cleansed with a pledget of cotton dipped in a weak solution of corrosive sublimate before inserting the catheter, and always to insert the latter by sight instead of by touch, in order to avoid carrying foreign matter into the bladder, whereby a vesical catarrh might be excited.

Vaginal Injections.—There is no agent in the treatment of diseases of the pelvic viscera which possesses greater value than this, and yet none which has been used from time immemorial in a more unsystematic and desultory manner. Until the appearance of Scanzoni's work, now over thirty years ago, very small amounts of fluid were used, not nearly enough to wash out the vaginal canal thoroughly, and the little piston syringe employed for the purpose, and holding only about an ounce, was utterly insufficient. Scanzoni taught us the important lesson that copious vaginal injections should always be employed where this method was resorted to, and gave us several very excellent plans for using them. This was an important step in advance. Since that time Emmet has done a great deal to systematize the matter, and introduced a method which we shall lay before the reader. His method is based upon the following deductions:

1st. That no patient can use vaginal injections efficiently herself, but must have them administered by another;

2d. That for them to be effectual the patient must lie upon the back with the hips elevated;

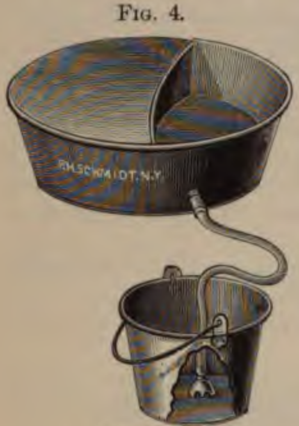
3d. That a copious flow over the vaginal surface of water varying in temperature from 100° F. to 110° F. is most appropriate for all cases in which congestion exists;

4th. That cold water thus employed is hurtful by causing first vascular contraction and afterward dilatation, while hot water produces first expansion and then contraction.

" The injection," says he, " can be better given to the patient after she is undressed for the night and in bed. She should be placed near the edge of the bed with the hips elevated as much as possible by the bed-pan, and a small pillow under her back, the lower limbs being flexed. Her body must be covered to protect her from cold, and her position made perfectly comfortable: whenever the bed is a soft one, for the purpose of keeping the hips elevated, a broad board should be placed under the pan to prevent it from sinking into the bed from the weight of the patient. The vessel of hot water is placed on a chair by the bedside, and the nurse passes the nozzle of the syringe into the vagina over the perineum, directing it along the recto-vaginal wall until it has reached the posterior cul-de-sac. The water must be thrown in at first very carefully, until the vagina has become distended."

In hospital practice there is no method as good as this carried out in all its details, but in private practice every one must see the difficulties which will attend it. Dr. Emmet says that " few women are so situated as to be unable to get some one to administer the injections properly." We would alter the sentence, making it read, " few women are so situated as to be able;" for a lady does not like to call upon a servant to perform so delicate a task for her, nor is she willing either to impose it upon an equal or to bear the heavy expense of having a professional nurse visit her daily. Under these circumstances we employ the following plan: The patient places a pillow under the edge of her bed, and an empty tub upon the floor under it. She then covers the pillow by a piece of India-rubber cloth which drapes into the tub. Then, putting two chairs, one on each side and a little in front of the tub, she places a small table in front of these, and upon this another chair. Upon the chair which stands on the table a tub containing about two gallons of hot water is now put, near the bottom of which has been inserted a spigot to which a long rubber tube is affixed, which ends in a vaginal nozzle. The patient now lies upon the bed, the pelvis elevated by the pillow, places her feet upon the chair, covers her limbs with a shawl or blanket, touches the spring—an ordinary clothes-pin or safety-pin makes a good one—which controls the flow, and the water bathes the vagina, and, running out, is conducted by the India-rubber cloth into the tub.

FIG. 4.

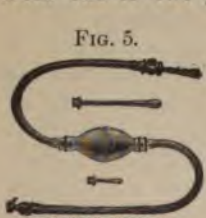

R.H.SCHMIDT.N.Y.

Douche-Pan.

Here the only articles purchased are the tub with the spigot and tube attached, and a yard of India-rubber cloth, which are inexpensive. The patient will have everything else in her chamber, and very little trouble attaches to the method, which is certainly an efficient one. Very convenient and inexpensive round or oblong douche-pans of zinc, which hold several quarts of water, are now made, on which the patient can lie comfortably while the water flows into the vagina from a fountain syringe suspended near by. The use of a nurse is thereby rendered quite unnecessary.

While we admit the great value of Emmet's method, we do not by any means admit his postulate, that "not the slightest advantage is received from them (vaginal injections) when administered with the patient in the upright posture, or, as is the usual method, while seated over a bidet." Thus administered, they are less effectual than in the method described, but still they do a great deal of good. While a patient is travelling, or in cases where injections are required only for cleanliness, they may be relied upon to do very good work, and we therefore describe the method of employing them: Placing in a tub from one to two gallons of water, at as high a temperature as proves comfortable to the patient, she may sit over it upon a board placed across it or upon a stool placed in it, and inject the water by means of a syringe. The most convenient syringes for the purpose are the Essex and Davidson's. Both of these are provided with a stem about five inches long, which, being introduced into the vagina and carried up so as to touch the cervix, throws, when the ball of the instrument is compressed by the disengaged hand of the patient, a steady stream against it. By this means a stream of warm water is made to pour over the cervix for from twenty to thirty minutes, according to the amount of fatigue which the use of the instrument causes the patient. Still, for the prolonged use of *hot* vaginal douches in the treatment of pelvic congestion or inflammation, we think the irrigation or fountain syringe, with the

FIG. 5.


DAVIDSON RUBBER CO.

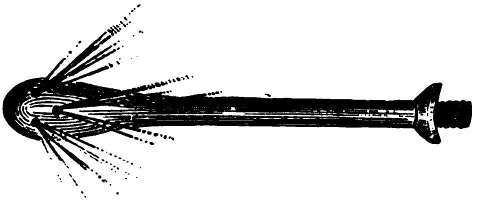
Davidson's Syringe.

round bed-pan just described, both of which permit the free douching of the vagina with large quantities of water with little inconvenience and no pain to the patient, to be absolutely essential to any permanent benefit.

Warm water is the best, as it is the simplest, most attainable, and cleanest, of all the emollients which can be used for this purpose. But it may easily be medicated by the addition of laudanum, half an ounce to the gallon, infusions of linseed, poppies, hops, bran, slippery elm, starch, hyoscyamus, conium, or farina, or by the addition of glycerin, one ounce to the gallon, lime-water or tar-water, both of which last are often very soothing to vaginitis that may exist as a complication.

A few words are essential in reference to the nozzle which should be used in giving these injections. No amount of care will prevent the injection of fluid into the uterine cavity unless the nozzle be properly constructed. Sometimes where the cervix is lacerated or the cervical canal dilated the patient will carry the instrument directly into the os externum and inject a large amount of fluid into the uterus. Such an accident is followed by violent uterine contractions and the probable passage of a portion of the liquid into and perhaps through the Fallopian tubes; and this often results in a degree of pain which almost causes collapse, and sometimes even in pelvic peritonitis. This accident can always be prevented by having the nozzle of the syringe made with a reverse current, as represented in the diagram. We have for many years employed those made of hard rubber, and it seems to us that, in view of the fact that serious accidents sometimes follow the use of nozzles with direct jet, the precaution of reversing the current should always be observed by instrument-makers.

Fig. 6.



Vaginal Syringe Nozzle, with reverse current.

The Tampon.—Had Sims's method of uterine examination done nothing else than lead to the proper manner of using the vaginal tampon, it would have done by that alone a vast deal of good. Before its introduction the use of the tampon was a painful, uncertain, and inefficient hemostatic method. Since the use of Sims's speculum it has become an easy, painless, scientific, and most effectual means for preventing and checking hemorrhage from the non-pregnant uterus. The operator in gynecology who does not understand the modern method of tamponing the vagina, and who still relies upon the introduction by the fingers of a "kite-tail tampon," a silk handkerchief, pieces of cotton, or this combined with sponge, etc., surely does great injustice both to his patient and himself, and fails to check the hemorrhage.

In speaking of the vaginal tampon a recent writer[1] says: "It is a barbarous, slovenly, unscientific proceeding, and is generally based upon incompetence and instigated by terror. If hemorrhage be issuing from a closed os, it may be plugged with a sponge tent, in order that the source may be afterward reached. But if the cause of the hemorrhage be known and be irremovable, the treatment should be to inject the uterus with acetic acid, or even with some salt of iron, though the latter is a proceeding accompanied by terrible risks." We quote this to say how entirely we dissent from it. The tampon properly applied is not only a simple, cleanly, and painless procedure: it is safer, more efficient, and more scientific than the alternatives here suggested. Above all things, avoid injecting solutions of iron into the uterine cavity: they form clots which are likely to decompose and cause sepsis, are difficult of removal in any case, and the vagina and uterine cavity become so contracted as to render future manipulations difficult. And also avoid packing the vagina with tampons soaked in solutions of iron, which contract the vagina and cause exfoliation of its epithelium. Only in cases of an exposed bleeding surface, as in cancer of the cervix, may a tampon soaked in a solution of liquor ferri persulphatis in glycerin or dipped in powdered persulphate be placed against the bleeding surface, the vagina being thoroughly protected by dry tampons.

The patient being placed upon a table upon the left side, Sims's speculum is introduced and held by an assistant, while with sponges or rolls of cotton the surgeon removes from the vagina all mucus and blood-clots which may exist there. Upon a plate near him have been placed a number of thick disks of carbolized cotton, some soaked in a saturated solution of sulphate of alum or copper, and others simply saturated with water. All superfluous fluid has been squeezed out by pressing these disks between cloths. Taking up in the dressing-forceps one of the disks which has been saturated with an astringent, the surgeon packs this behind the neck of the uterus; then alongside of this he places another, holding the first one well in place, meantime, by a rod of whalebone or other similar substance until the second is placed. In this way piece after piece is packed away until a collar is placed around the neck of the uterus which extends to a level with the os externum. Then this part is covered with more astringent cotton, which is packed into place and held there by pressure from a rod, and simply wet cotton is packed upon it until the vagina has been filled to within an inch of the vulva, when a piece of soft dry cotton is made to hold the more efficient upper tampon in position. The lower portion is now carefully pushed away from the urethra, and, a dry soft towel being laid over the vulva, a T bandage is applied.

Such a tampon is a safe hemostatic agent. After operations upon the uterus or cervix, and occasionally upon the vagina, it proves a most certain preventive of hemorrhage. As a means for checking hemorrhage already fully established it has no equal in value in gynecological surgery.

When it is necessary to remove this tampon, which may be left in position for twenty-four or even thirty-six hours, the following method should be adopted: The Sims speculum should be gradually introduced, and each piece of cotton as it becomes visible be caught by a tenaculum or dressing-forceps and pulled out, until the last piece is removed. The vagina, having been thoroughly cleansed with cotton dipped in carbolic or sublimate solution, is retamponed in the same manner, provided danger of hemorrhage still exists.

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[1] Lawson Tait, *Diseases of Women*, 1877.

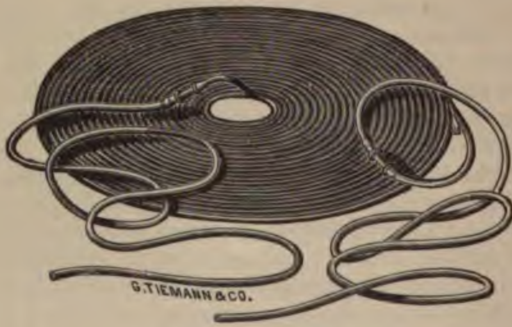
Since the introduction of iodoform into surgical practice, iodoform gauze in long strips forms a very efficient substitute for the disks of cotton formerly employed; it packs well and tightly, causes coagulation of blood, and remains perfectly sweet even as long as a week. As soon as saturated, the iodoform-gauze tampon, like any other form of tampon, should be removed, as it has outlived its usefulness as a hemostatic.

Means for controlling the temperature after operations and during pathological conditions developing in gynecology.

A rise of temperature exceeding one or two degrees always means some pathological condition which should be inquired into, and when discovered if possible removed. Reaction, constipation, acute inflammation, and septic absorption may each, in rising proportions, cause an increase of temperature which will usually be higher near the seat of the cause than at some distant portion of the body. While a rise of temperature of from one to two degrees may not necessarily mean anything serious, it should certainly not be overlooked, and if possible be removed. A constant higher temperature, above 103° F., continuing through a period of a week or more is sure to depress the vital energies by consuming not only the strength which is derived from the nourishment taken, but by also sapping the central nerve-forces; therefore a prolonged high temperature may undoubtedly be said eventually to kill. For the purpose of preserving the strength of the patient, preventing the undue consumption of nerve-power, and making the patient more comfortable, it must always be our object to keep the temperature as much as possible within physiological bounds, having first satisfied ourselves, of course, as to the cause of the rise. Naturally, it would be illogical and unwise to deprive ourselves of the proofs furnished by various rises of temperature, which would aid us in making a correct diagnosis, by lowering it before the diagnosis is made. When the last edition of this book was written a method had come into vogue, which was really a revival of an old-time practice fallen into disuse, of reducing high temperature, chiefly after grave operations, by keeping the body immersed in more or less cold water, the patient being placed on a rubber cot and enveloped in sheets which were kept drenched by a slowly-flowing stream of water. Undoubtedly, this method was extremely effectual in reducing temperature, but, unfortunately, many patients, particularly emaciated and debilitated women, often suffering from the shock of a prolonged and dangerous operation, could not withstand the steady lowering of temperature thus induced, and sank under the treatment. Gradually this method has been abandoned, having been replaced by various newly-discovered chemical agents which, with very much less trouble, and if carefully watched with scarcely any detriment to the patient, are capable of reducing temperature quite as rapidly and effectually as the cold-water affusions. Therefore in recent years we have relied almost entirely upon antipyrine, antifebrin, and phenacetin for this purpose. It is true, these agents, particularly antipyrine, have a certain depressing influence upon the heart; hence we rarely employ the first remedy when there is any indication of cardiac debility; but by not using too large doses, not more than ten grains at the time, and by perhaps combining them with some cardiac stimulant, such as caffeine or strophanthus, and by watching the effects carefully when repeated, we have been able thus far to avoid any unpleasant results. Ten to twenty grains of one of these agents will usually reduce the temperature two to three degrees, make the patient comfortable, give her a good sleep, and renew her strength to battle with the disease. That is all we ask of these antipyretics, depending upon other and more potent remedies to relieve and cure the cause of the fever. We have thus for weeks kept in check the daily-recurring high temperature in cases of puerperal septicæmia, sustaining the patient's strength by stimulants and nutrients until the septic poison was eliminated, and with it the temperature dropped permanently to its normal rate.

The possible assistance of the cold wet sheet wrapped about the trunk and renewed as often as it becomes warm should, with proper care, not be forgotten in bad cases. In local pelvic inflammations where the temperature runs above 102° F. we are in the habit of reducing it, as well as of relieving pain, by the steady application of large flat ice-bags or of the ice-water coil (a coil of rubber tubing through which ice-water is kept constantly flowing from an irrigator). A dangerous reduction of temperature is scarcely to be feared from these local applications of cold. In a very depressed condition of the general system great caution should, of course, be observed with these, as with all measures tending to depress the vital forces.

Fig. 7.


G.TIEMANN & CO.

Ice-water Coil.

CHAPTER V.

DIAGNOSIS OF THE DISEASES OF THE FEMALE GENITAL ORGANS.

THE diagnosis of the diseases of the pelvic viscera of the female offers many obscurities, and frequently foils the most careful and capable practitioners. With the utmost caution, assisted by the most practised skill, no one can avoid occasional errors, while in the experience of those not possessing these qualifications they must be frequent and glaring. The only safeguard which can be established against their occurrence and the only guarantee which can be obtained for success in prognosis and treatment, is the thorough mastery of the subject which is now to engage us.

It is not rare for one making a special study of gynecology to find those less familiar with it committing errors of diagnosis—or, what is more common, arriving at no conclusion—in cases which are perfectly simple and present no obscurities whatever. When meeting such instances in the practice of intelligent men we have been struck by the fact that the source of difficulty is almost always the same. The failure of diagnosis has not been due to their having drawn incorrect conclusions from diagnostic means, but to their not having brought these means fully into action and properly applied them to the solution of the case in hand. In many instances, uterine disease being suspected, the physician employs vaginal touch and follows it by the speculum. If the cervix be diseased, he is successful in diagnosis; but if not he becomes discouraged, forgetful of the fact that rectal touch, the uterine probe, dilatation by tents, conjoined manipulation, and other means should be resorted to, and that without appealing to these even the most skilful diagnostician would be as helpless as himself. There are means at our command for exploring every tissue within the pelvis—the uterus, the ovaries, the areolar tissue, etc.; and until they are brought into service carefully, systematically, and thoroughly no one can feel that he has done justice to his powers of diagnosis or allowed himself full opportunity for drawing correct conclusions. Skill in diagnosis must be obtained at the bedside, but for that school to be made profitable the student must have a thorough familiarity with the theory of the means of investigation which he is there to apply. Having mastered these, let him in an obscure case develop them one after the other, slowly, carefully, and thoughtfully, until he has arrived at a diagnosis, or at the fact that he is unable to make one even after having availed himself of all the resources at his command.

Let us illustrate this by a supposititious case: An inexperienced examiner discovers upon vaginal touch that the vagina is occupied by a large tumor. If he rest satisfied with this method of exploration, and without reflection adopt the idea that the case is one of fibrous polypus, he may commit a grave error. The most skilful of gynecologists could not decide by touch alone, and would be, almost as much as he, exposed to error if he relied upon it. All the means which the experienced diagnostician can bring to his aid are likewise at the service of the inexperienced; and if the former stand in need of their assistance, surely the latter much more decidedly requires it. Let him then ask himself this question, although he may feel absolutely positive, altogether certain, that he is dealing with a fibrous polypus: What else may this be? At once the answer will come, It may be a case of prolapsed uterus or of inversion of the uterus. It is important that he should know which it is, and usually it is quite easy to decide.

Drawing down the tumor, he examines by inspection and touch, and seeks the os externum, up which to pass the sound. It is not anywhere to be found, and moreover the tumor is larger below than it is above. The case is not one of prolapsus, and he feels that his diagnosis of polypus is surely correct. If it be a polypus which occupies the vagina, the uterus should be above it. He now practises conjoined manipulation, but to his surprise this organ is nowhere to be felt. This may be due to his want of experience, and he examines further with the sound, endeavoring to pass it alongside of the neck of the tumor and into the uterine cavity. He is surprised again to find that it is arrested at the neck of the tumor, around which he now passes his finger, and finds it closed everywhere by a gutter of circular character existing about an inch above the lips of the dilated os. The case now looks like one of inversion, but he is not sure, for sometimes adhesive inflammation attaches the walls of the cervix to the neck of the polypus. Are there any means by which he may settle this question positively? By conjoined manipulation he thinks that he feels a ring or circle over the abdominal face of the tumor, and gradually he pushes his fingers into it and becomes positive of its existence.

Now, placing the patient upon the back, he passes one finger into the rectum and a sound into the bladder, and approximates them above the tumor. He finds no uterus intervening, and his diagnosis is made: the case is one of inversion of the uterus. This is his diagnosis; that is, his deduction carefully and philosophically drawn from the premises presented to him by the best means at his disposal. Let him resort to all these means, and success will usually be his. But, it may be suggested, he is not as familiar with these means as a more experienced man is. Practically, we agree that he is not; but why is he not theoretically? Are they not recorded and fully explained in all his works on gynecology? What is demanded of him is not experience, not wisdom, but a faithful and earnest effort to arrive at the truth by simply employing means which science places at his disposal.

These remarks of course apply with equal force to every condition in which a diagnosis is required. Let it be a constant habit to demand of one's self, after admitting a suspicion as to the nature of the disease, What else could present the physical appearances which exist? Having carefully considered this, let the various means of differentiation at command be fully tested. Then if an error of diagnosis creep in to damage interests entrusted to his charge, the mortified diagnostician may console himself with the reflection that at least he has exerted himself to the utmost of his ability to avoid it, and not fallen into a trap set for him by carelessness, indolence, or incompetency.

It must not be forgotten, however, that certain rare and exceptional cases will occasionally occur, the diagnosis of which will baffle the skill and experience of the most cautious and conscientious. Take, for example, the following:[1] A patient aged sixty-two years had a movable abdominal tumor which was examined by a number of physicians. She died suddenly, and autopsy revealed extra-uterine pregnancy, a child weighing four and a half pounds lying loose in the peritoneal cavity. Or this:[2] A tumor is discovered in the pelvis; the patient dies from some cause disconnected with it, and it is found to be a displaced kidney.[3] But such cases are rare. The careful and intelligent diagnostician will very generally be successful.

Rational Signs.

In the examination of a patient suspected of having uterine disorder no direct or suggestive questions should be asked, but the symptoms should be drawn forth by encouraging and properly directing her narrative of her case. Certain signs, which we call "rational" from their appealing to our reason and not to our senses, such as pain in the head, back, and limbs, menstrual disorder, leucorrhœa, impeded locomotion, derangement of the digestion, and nervous manifestations, will lead us to suspect the genital organs, and may even convince us of the existence of disease there. Generally, however, they result in the adoption of other and more certain means of diagnosis, which are termed "physical."

Every one will, after due experience, adopt some system by which his examination of patients will be expedited and the certainty of arriving at a correct diagnosis be increased. The plan which we consider best adapted to these ends is that which follows:

1st. The personal history, age, etc. of the patient should be obtained.

2d. The duration of the illness should be fixed.

3d. The history of the attack from commencement to date should be elicited.

4th. The present state of the patient should be ascertained.

In obtaining the history of the disease no leading questions have thus far been asked; the patient has told us what she herself has observed. Her evidence leads us to suspect some special disorder, and then we proceed thus:

5th. Direct questions are put with the intent of testing the correctness of the suspicion which the patient's story has excited.

[1] *N. Y. Medical Record*, Feb. 1, 1872, p. 539.

[2] *Braithwaite's Retrospect*, Part 37.

[3] I removed by laparotomy a tumor of the size of an orange situated behind and to the left of the uterus, as low down as the pelvic floor, which I took to be an enlarged and adherent ovary and tube, but which proved to be the left kidney, which I had peeled out of its capsule as neatly as it could have been done on the post-mortem table. Of course nothing remained but to remove it. The patient made a comparatively uneventful recovery. (See *N. Y. Med. Journal*, July 21, 1888.)—P. F. M.

6th. Physical means are brought to the corroboration of the diagnosis by rational ones.

Forms, either written or printed, such as that which follows, will not only save a vast deal of time and trouble, but give uniformity to histories taken, so that after a number of them have been accumulated they may be collated with reference to special points or preserved for personal reference or publication:

CASE, No. .... Date, ...

Name .... Age .... Married?

No. of children .... No. of abortions .... Time since last

pregnancy .... Age at which menstruation appeared ....

Duration of present illness .... Symptoms during its course

....

....

....

....

....

Supposed cause ....

Present condition as regards—

Menstruation.
- Regularity ....
- Amount ....
- Pain ....

Leucorrhœa.
- Character ....
- Amount ....
- Constancy ....

Pain.
- Locality ....
- Degree ....

Locomotion ....

Other symptoms ....

Physical signs.
- By touch ....
- By speculum ....
- By probe ....

Other organs ....

General health ....

Diagnosis .... Prognosis ....

Treatment ....

Result ....

It will be observed that we have not enumerated the various rational signs generally attendant upon uterine affections, but merely the means for drawing them forth. Their special mention will be reserved for the study of particular affections. If the evidence elicited leaves any of the pelvic viscera under suspicion, this is verified or removed by means which are more positive and reliable from the fact that they address our senses.

It will further be seen that the headings of our table are not numerous, nor the table itself lengthy or exhaustive. Our belief is that the chief reason why such tables are not more generally employed is that they are so long and so filled with non-essential items as to become tedious and impracticable. This table is that which we employ in daily practice. We find that when filled out it gives all the salient points in our cases, and these are all that we desire ordinarily to preserve.

Management of Patient during the Physical Examination.

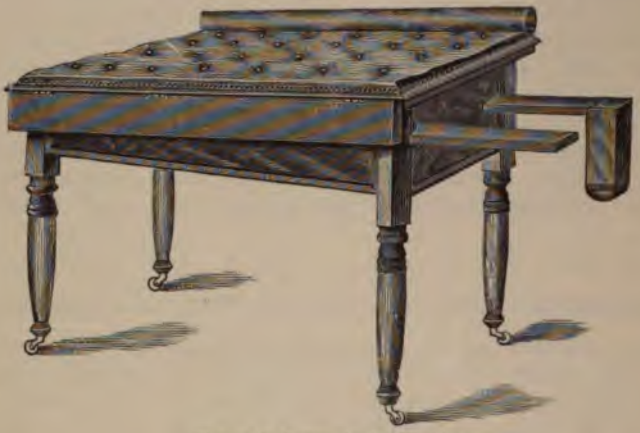
Before commencing the consideration of physical signs, we shall make a few remarks upon a subject of great importance in this connection—namely, the management of the patient during the examination. As Dr. Sims has taught us, she should never, unless it be impossible to do otherwise, be examined upon a bed or sofa, but upon a table covered with a blanket, shawl, or rug of some kind and provided with a small pillow. The facility thus given for thorough investigation is very great, and the avoidance of the sinking of the body into the soft bed repays most fully the extra trouble which it causes to make the change. It may be said that many ladies will strongly object to the exposure incident to getting upon a table. This is not so: a little persuasion will overcome such objections at once, and the increased exposure is in reality imaginary, for the table is to all intents a bed, and a sheet for covering the person gives all desirable protection. Should it be necessary to employ a bed, the leaf of a dining-table or a wide board should be slipped across the mattress under the upper sheet and covering, and a hard surface will thus be presented for the patient to lie upon, which will obviate in great degree the objections to the bed otherwise arranged.

The patient should always lie upon her back in a first examination, with the clothing loose around the waist, the knees drawn up, and the abdominal walls relaxed. A sheet should be spread over her so as to conceal the entire person. The table having been previously turned to a window admitting a strong light, a chair should be placed at its foot for the examiner, and at the right side of it another upon which has been arranged a basin of warm water, soap, and a towel.

At the homes of patients, whenever a thorough digital examination of their pelvic organs is to be performed, we always place the patient crosswise on her bed, with nates close to the edge and knees elevated. Even patients suffering from acute pelvic inflammation or puerperal septicæmia can be placed in this position without much exertion or exposure; and it is only in this manner that a thorough and careful bimanual examination can be made, unless we resort to the often inexpedient, and perhaps hazardous, plan of putting the patient on the table just referred to.

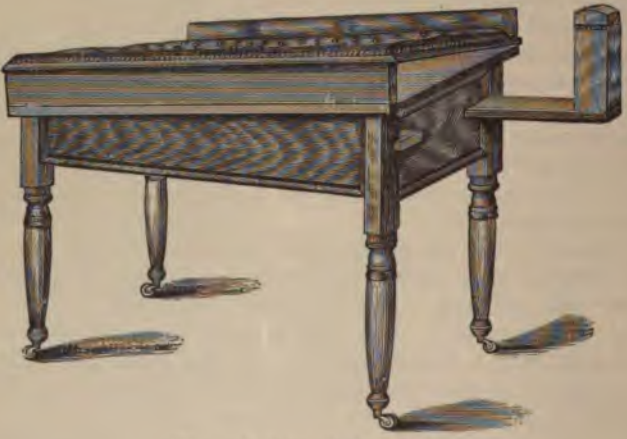
A variety of tables for these examinations in the physician's office are now before the profession. We here present that which we employ both in office and hospital practice. For the cylindrical speculum it presents the advantages of an ordinary table; for Sims's speculum, a great many more. Fig. 8 represents the table prepared for an examination on the back; a pillow supports the head, the buttocks are slightly elevated, and the feet rest upon the projecting pieces. When this examination is completed the patient stands upon the chair or stool

FIG. 8.



Thomas's Gynecological Table.

FIG. 9.



Thomas's Gynecological Table.

recently occupied by the examiner, and the table is changed for examination with the speculum in Sims's position, as shown in Fig. 9. The top of the table is now elevated at one side, so that it slants decidedly to the other. The ankles of the patient, resting one upon the other, are supported by the projecting pad upon the end of the foot-piece. The other foot-piece has now been pushed into the body of the table. This position, by gravitation, throws forward the viscera, and thus aids in rendering the action of Sims's speculum more perfect. It will be observed that the slanting surface of the table is now supported by the hinged piece which in Fig. 8 lies as a flap along the side of the table, but in Fig. 9 is turned up. [I have modified this table, which I have used for many years, by gradually adding to it various drawers for the keeping of instruments, one of which, at the left of the foot of the table, is also used as a step for the patient to mount. The lateral tip has not been used by me for some years, as I have found the correct latero-abdominal position amply sufficient for specular examination.—P. F. M.]

Means of Physical Diagnosis.

WE shall enumerate and consider these in the order in which they will generally be employed in a case requiring the aid of all of them for its elucidation:

1. Anæsthesia.
2. Inspection.
3. Vaginal touch.
4. Conjoined manipulation.
5. Abdominal palpation.
6. Abdominal palpation conjoined with the use of the sound.
7. Rectal touch.
8. Vesico-rectal exploration.
9. The speculum.
10. The uterine probe and sound.
11. The elastic sound.
12. Tents.
13. The dull curette.
14. The exploring needle.
15. The aspirator.
16. The microscope.
17. Auscultation and percussion.

ANÆSTHESIA.—This should not be resorted to unless there be some special indication for it. Should the patient be intractable, delirious, or a malingerer, should the investigation involve much severe pain, or should there be some tonic spasm of the muscles as an element of the disease, as in the case of spurious pregnancy and phantom tumors, it affords an aid to diagnosis of great value and should never be neglected. When we are forced to examine a virgin who is very sensitive and opposed to the investigation, it is sometimes advisable, for without it a diagnosis is frequently impracticable. One even of large experience is often greatly surprised by the results of two consecutive examinations, the one without and the other with anæsthesia. The second not only corrects the shortcomings of the first, but throws a flood of light where obscurity existed before.

INSPECTION.—We invariably make a practice, before examining new patients, to expose the external genital organs under the sheet, and to examine them carefully for any possible pathological conditions. We may thus find enlargement of the labia majora, nymphæ, or clitoris, or mucous patches, or pediculi pubis, of which no mention was made by the patient during the oral examination, or a lacerated perineum, a protrusion of the anterior or posterior vaginal wall, or hemorrhoids, or a urethral caruncle,—all of which we might possibly not have discovered if we had not inspected the external genital organs. If there is a suspicion of an abdominal tumor, inspection will reveal its shape, size, and certain irregularities in it which differ from the ordinary regular ovoid outline of a unilocular ovarian cyst or the pregnant uterus; which irregularity probably stamps the tumor as a polycystic one.

VAGINAL TOUCH.—This, which will be the first explorative measure to which the examiner will resort, constitutes one of the most important at his command. It will reveal much or little as it is practised slowly and thoughtfully, or hastily and as a matter of routine. In making it, the index finger of either hand may be employed, and when it is desirable to reach as far up the pelvis as possible the index and middle fingers may be used. During this examination the patient should invariably be laid upon the back, with the legs flexed and the buttocks very near the edge of the table. The observance of this position is of great importance, as vaginal touch should in every case be combined with abdominal palpation, to which union the name of conjoined manipulation or bimanual palpation has been applied. Too much stress cannot be laid on the invariable observance of this rule.

The index finger of one hand, being introduced into the vagina, the other fingers being flexed into the palm and the thumb laid upon them, passes directly to the cervix uteri, assuring the investigator as it goes of the perviousness of the vaginal canal. Upon reaching the os, this part is carefully examined with reference to size, consistency of lips, and character of discharge, a patulous os, with soft, velvety sides covered by a glutinous secretion, admonishing him of the existence of inflammation of the os and cervical canal. The cervix should then be examined with reference to location, size, and density. This being done, the finger should be slid along its posterior surface into the recto-uterine space, and the presence of any hardness or tumefaction there be noted. Should such be found, it will probably be due to one of these causes: retroflexion or retroversion of the uterus, uterine enlargement, a fibrous tumor, scybalæ in the rectum, inflammatory products the result of peri-uterine cellulitis or peritonitis, a prolapsed ovary or ovarian tumor, or a hematocele. Should no tumor be discovered, but the line of resistance given to the finger be found to disappear at the vaginal junction with the uterus, it may be inferred with moderate certainty that at this point none of the above-mentioned conditions exist. The finger will also ascertain whether the normal mobility of the uterus is present by attempting to move the organ in various directions through pressure on the cervix. The absence of such mobility would denote the pre-existence of pelvic inflammation and the presence of pelvic adhesions.

This space being explored, the finger should then be passed anteriorly, and swept upward and forward along the base of the bladder toward the symphysis pubis. Any hardness discovered here will probably be due to anteflexion or anteversion of the uterus, a fibrous tumor, stone in the bladder, uterine enlargement, or possibly cellulitis.

The state of the ovaries should then be tested by lateral pressure, and the condition of the pelvic areolar tissue and walls be ascertained by firm pressure in all directions.

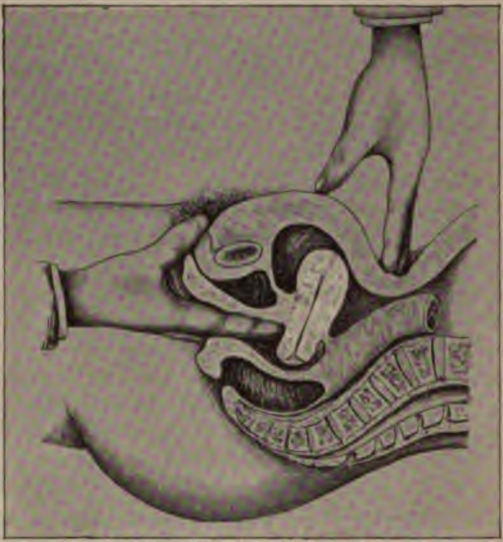
In certain rare and obscure cases—such, for example, as those in which a diagnosis of large tumors in the vagina is very difficult—it becomes necessary to introduce the whole hand into the vagina. This procedure, which should be resorted to while the patient is anæsthetized, must be practised with the greatest caution. Otherwise injury may be done to the parts about the vulva, and a large and carelessly managed hand may produce rupture of the vagina.

One manœuvre, by which touch of the parts lying closely in contact with Douglas's cul-de-sac is much facilitated, still remains to be mentioned. Where small tumors exist behind and disconnected with the uterus, or where enlarged and prolapsed ovaries are to be sought for and examined, an excellent result is often obtained by placing the patient in Sims's left lateral position, and passing the index and middle fingers of the right hand as high up as possible, their palmar surfaces looking toward the posterior wall of the vagina. By this method we have repeatedly detected enlarged and slightly displaced ovaries which in the dorsal decubitus had entirely escaped observation.

CONJOINED MANIPULATION, OR BIMANUAL PALPATION.—As the preceding examination consists in touching organs above the pelvic roof for the most part, and which are generally quite movable, it is evident that its results are diminished by ascent of these parts as they are pressed upon. To bring them more fully within the reach of the finger in the vagina, and to prevent their retreat, abdominal palpation should invariably be combined with vaginal touch. While the latter is being performed by the index finger of one hand, the other hand should be placed on the abdomen, and by it the uterus be made to descend, so that even its upper parts may become accessible. This will enable the examiner to sweep the finger in the vagina over the posterior, anterior, and lateral surfaces of the organ, and detect the presence of any enlargement, sensitiveness, or abnormal growth there. Fig. 10 represents this.

But not only should the walls of the uterus be thus explored: the volume, shape, sensitiveness, and regularity of surface of this organ, as well as of the ovaries, the broad ligaments, anterior vaginal wall, and bladder, should likewise be ascertained. To accomplish this with reference to the uterus, let the finger in the vagina be placed under it—anterior to the cervix if it be in normal position or anteflexed, posterior to it if it be retroflexed—and the organ will be distinctly felt resting between it and the fingers which depress the abdominal wall. By the same method the other parts mentioned should be examined. Conjoined manipulation is of great importance; indeed, no examination can be considered complete without it. By a neglect of this seemingly trifling precaution we have known the existence of large tumors, and even of pregnancy quite advanced, entirely ignored. Some time ago a physician sent to us from a distance a case which he supposed to be one of prolapsus uteri, from the fact that the uterus was low in the pelvis, never suspecting for a moment the existence of two fibrous tumors, each the size of a fœtal head, which depressed the displaced organ.

FIG. 10.



Practice of Conjoined Manipulation.

Were we called upon to mention the most important method of diagnosis at the disposal of the gynecologist, not excepting the speculum and sound, or even the two of them together, we should unhesitatingly select conjoined manipulation. Until recently it was less generally known, and much less generally appreciated, than it deserves to be.

Not only may this method be practised by combination of vaginal touch with abdominal palpation: it may likewise consist of the combination of the latter with rectal touch by one finger, or by the introduction of the forefinger into the bladder, after dilatation of the urethra.

ABDOMINAL PALPATION.—The practice of bimanual palpation will have assured the investigator of the presence of any tumors which may exist in the pelvis. Should such have been discovered, a further examination will of course at once be entered upon to ascertain their size, shape, attachments, and contents. In this exploration both hands are employed externally, and by them firm pressure is made and the abdominal walls depressed, so that by grasping the masses their characters may be appreciated. By this means the diagnostician decides as to the solidity or fluidity of tumors, their sensitiveness to pressure, the presence of fœtal movements, and other points of equal importance.

ABDOMINAL PALPATION CONJOINED WITH THE USE OF THE SOUND.—We shall very soon speak of the uterine sound in relation to its ordinary and more legitimate functions. Here we allude to it only as a means of rotating the uterus in the pelvis in order that the hand pressed upon the abdomen may separate it from enlargements in the abdomen. This method of investigation is of so great value, and appears to us so little appreciated and so rarely practised, that we wish to draw especial attention to it. Let us suppose that a tumor occupies the pelvis or lower portion of the abdomen, and it be desired to determine how close a relation exists between it and the uterus. The sound being passed to the fundus, the patient lying upon the back, it is made to rotate the uterus. The left hand, which is unoccupied, is now placed on the abdomen, so as to become cognizant of movements in the uterus and tumor. If both move equally, their connection is intimate; if the uterus move freely and the tumor but little, it is less marked; while if the tumor remains stationary during rotation of the uterus, there is probably no connection or one only by lengthy bonds of union.

Again, in cases where palpation and conjoined manipulation fail to map out the position of the uterus on account of obscure pelvic tumors or great obesity of the woman, lifting the organ by the sound and rotating it under the palm laid upon the abdomen is a valuable resource.

Lastly, in cases of supposed fibrous polypus, where one fears to operate lest an inverted uterus may have misled him, although the passage of the sound alone makes him almost sure as to diagnosis, it gives confidence to feel the uterine body rolling under the hand laid over the abdomen, for it is not an unheard-of occurrence for the sound to pass through the uterine walls and enter the peritoneum.

We would urge this procedure, as a rule, in the examination of abdominal and pelvic tumors. Indeed, in a large number of such cases a neglect of it will allow of errors in diagnosis which by its adoption might have been avoided.

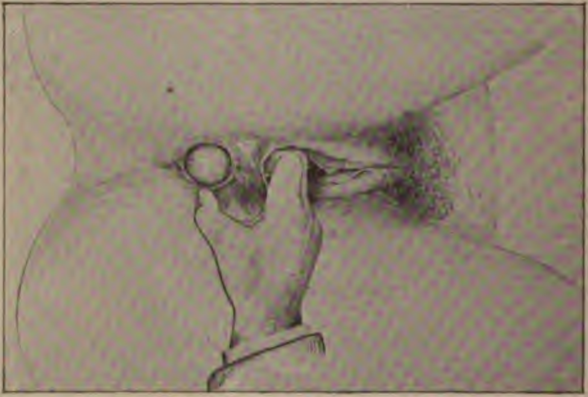
The method of exploring pelvic viscera of the female by means of the whole hand introduced into the rectum, first practised and recommended by the late Prof. Simon of Heidelberg, has now fallen into general disuse, for the reason that rupture of the intestine was produced in a number of cases with fatal results, and that with our present improved methods of diagnosis, and the practice daily growing more popular of deciding the exact nature and complications of a pelvic or abdominal tumor by the fingers, introduced through an abdominal incision, the necessity for a rectal exploration of such severity is entirely done away with.

A great deal more can be accomplished by the introduction of the hand except the thumb into the rectum, after stretching the sphincter ani, than by the old method of introducing only one or two fingers.

Should any substance lie in the recto-vaginal space, its character may be accurately appreciated by what has been styled by Dr. Tilt the "double touch," which consists in introducing the index finger into the rectum and the thumb into the vagina, and then approximating them. Or the index of one hand may be introduced into the vagina and that of the other into the rectum.

DIGITAL EVERSION OF THE RECTUM.—The lower portion of the rectum may be very easily exposed, although this manipulation is attended with some pain, by inserting two fingers into the vagina and everting the part of the rectum thus controlled through the anus. The diagnosis of internal hemorrhoids, fissure, catarrh, and ulceration of the lower part of the bowel is thus very readily made.

FIG 11.



Digital Eversion of the Rectum.

VESICO-RECTAL EXPLORATION.—This consists ordinarily in passing a catheter or sound into the bladder and pressing it toward the index finger in the rectum. Its scope is not extensive, but for some purposes no other method answers the same end, as, for example, for the following:

Appreciating the size of the uterus in very fat women;
Detecting absence of the uterus;
Differentiating inversion from polypus.

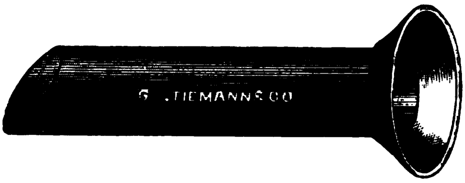
The only difference between this method and conjoined manipulation consists in the attempt to grasp the uterus between the finger and sound instead of between the fingers of the two hands.

This method may be practised in still another manner—that proposed by Noeggerath. It consists in dilatation of the urethra by graduated dilators, the introduction of the index finger of one hand into the bladder and that of the other into the rectum or vagina, and the approximation of these, so that the uterine walls, anterior, posterior, and lateral, can be carefully and thoroughly examined. This method, like that of Simon, should be resorted to only in obscure and difficult cases not susceptible of elucidation by other means.

THE SPECULUM.—This is by no means our most valuable diagnostic resource. Too great a reliance upon it as such is calculated to diminish the physician's powers for arriving at a correct conclusion in obscure cases. Unquestionably, the greatest benefits derived from the speculum demonstrate themselves in the therapeutic department of this subject. As a diagnostic means it is inferior to vaginal and rectal touch combined with abdominal palpation, and chiefly aids us in this field by opening the way to the proper use of the uterine probe, which constitutes one of the most reliable methods at our command for appreciating the condition of the cavity of the uterus. Let any one who is surprised at the statement—which many will be—reflect as to what can really be seen even in aggravated cases of disease, except malignant, granular, and cystic degeneration of the cervix. The position of the uterus, its mobility, the presence of a foreign body in its cavity, the condition of its surrounding tissues, can none of them be learned from the sense of sight.

All vaginal specula may be classified under two heads—cylindrical and valvular. Of the first variety, cylinders of metal, porcelain, ivory, and wood are in general use. None of these compare in elegance, cleanliness, and utility with that of Dr. Fergusson of London, which consists of a tube of glass coated with quicksilver and covered by India-rubber, which is thoroughly varnished. This instrument is represented in Fig. 12.

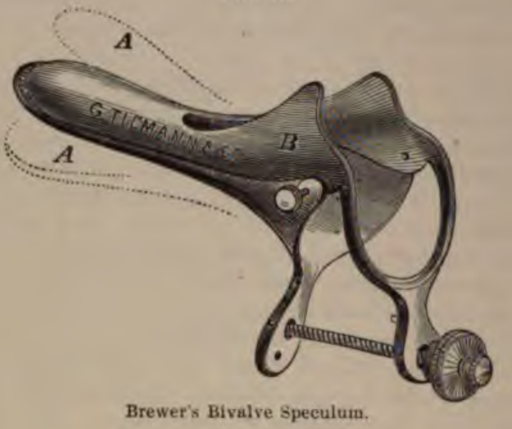
FIG. 12.



Fergusson's Speculum.

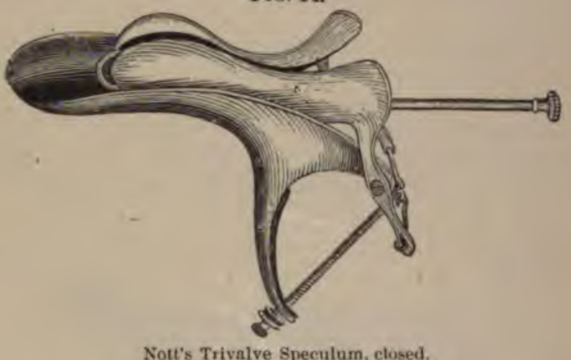
As a rule, cylindrical specula are made too long; they should not be longer than from four to five inches, and should come in sets of at least four, measuring from one to two and a half inches in diameter. The antiquated instruments of Cusco, Ricord, Ségallas, and Charrière, with their numerous modifications, all constructed on the principle of a closed flattened metal tube, which, after introduction into the vagina, is opened and expanded by means of a screw in the handle, are no longer employed by the progressive gynecologist. The general practitioner will, however, still find himself compelled, in the absence of an office nurse, to use either the cylindrical or one of the improved forms of valvular specula; and for his benefit we mention the instruments of Brewer and Nott as the best instances of the bivalve and trivalve varieties respectively.

FIG. 13.



Brewer's Bivalve Speculum.

FIG. 14.



Nott's Trivalve Speculum, closed.

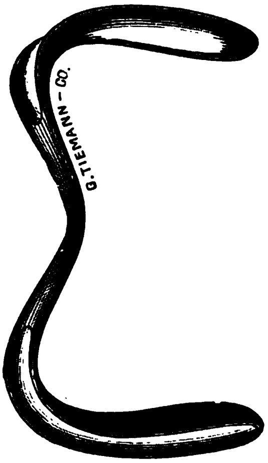
A peculiar, double shoehorn-shaped speculum has been devised by the late Prof. Neugebauer of Warsaw, which has found favor in the eyes of Barnes, Chadwick, and a few other gynecologists. We, personally, have never felt the need of it.

All valvular specula, however, present these great disadvantages: It is difficult to avoid prolapse of the vaginal wall between their branches, and in removing the instrument these are liable to be painfully pinched. If upon introducing and expanding their branches the os uteri is exposed, all goes well; but if it is not in the field, these instruments are awkward and unwieldy in overcoming the difficulty; indeed, in many cases the speculum must be withdrawn and reintroduced to accomplish the result. In virgins both cylindrical and valvular specula are usually impracticable without serious damage to the hymen and great pain; only the very smallest size of a cylindrical speculum may be inserted through the orifice of an elastic hymen, usually with the result of admitting so little light as to render its employment useless. In a married but nulliparous woman, and above all in a multipara, both forms of specula can usually be employed without difficulty or pain.

Like the cylindrical, valvular specula in general use do not, as a rule, admit of probing the uterus and making applications to the fundus. We do not deny that in some cases it is possible, nor that by perseverance a skilful operator may succeed in effecting these objects in many instances, but it is usually so difficult that the general practitioner will not find such specula available for these ends.

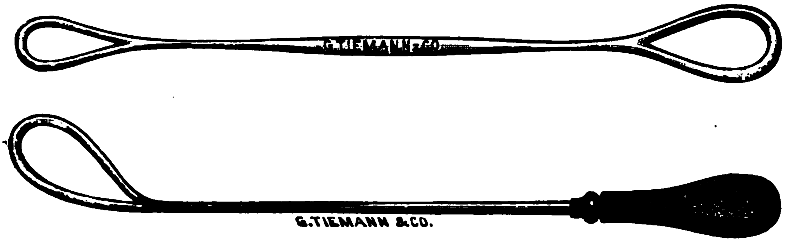
Sims's speculum, Fig. 15, which is in reality a bivalve, obviates all these difficulties in the most complete and satisfactory manner. In exposing the uterus it develops a principle not brought into action by any other variety—the dilatation of the vaginal canal by air, which enters on account of the position of the patient and gravitation of the pelvic and abdominal viscera. We have stated that this instrument is a bivalve speculum: the upper valve is constituted by the blade of the speculum itself, and the lower by the depressor, represented in Fig. 16, which acts upon the anterior wall.

Fig. 15.



Sims's Speculum.

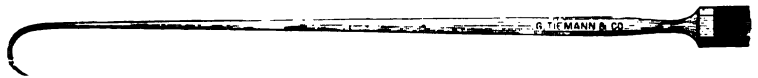
Fig. 16.



Sims's Depressor.

The facility which Sims's instrument gives for exploration and treatment is very great—so great, we think, that the practitioner devoting himself to gynecology who does not avail himself of it loses a much greater advantage than the auscultator would forego in not bringing to

Fig. 17.

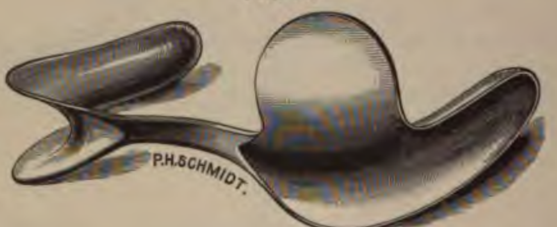


Sims's Tenaculum.

his aid the double stethoscope of Camman. But, unfortunately, for a time this instrument presented such disadvantages that it could not come into general use. In the hands of those attending a sufficient number of cases of uterine disease to give them skill in manipulation and opportunity for thoroughly familiarizing themselves with it, it always filled a large place, but in general practice it has been slow in becoming popular. It cannot well be employed without an assistant, and this assistant requires a certain amount of training to enable him or her to hold the instrument intelligently and without fatigue. But this training is easily acquired, and it is now rarely difficult to find a nurse or some female friend ready and able to help us in case we should unexpectedly need her assistance. Still, the fact that any assistant is needed has incited many to alter Dr. Sims's original model so as to combine its advantages in instruments free from the objections which have been mentioned.

When the posterior vaginal wall is lifted by Sims's speculum, the anterior must be depressed by an instrument held in the other hand. Thus both hands are occupied and the operator is bereft of power to proceed. The object of the alteration is to liberate one hand in order that the further steps of the examination may be proceeded with.

FIG. 18.



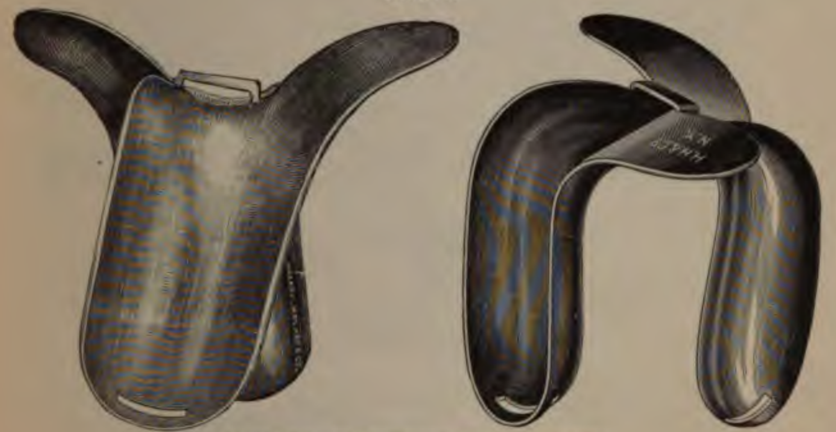
Mundé's Flange Sims's Speculum.

Drs. T. A. Emmet, T. G. Thomas, the late Dr. J. B. Hunter, A. F. Erich, and W. L. Studley have all invented very serviceable, but unfortunately too complicated, instruments designed to enable the operator to dispense with an assistant. So far as we know, they have not met with popular favor. A comparatively trifling modification, merely designed to support the superior buttock, so as to prevent its obstructing the view into the vagina, has been devised by Mundé, who has used it exclusively for the last seven or eight years. This instrument, with a depressor to match, has recently been constructed of aluminium by George Tiemann & Co., and both are specially noticeable through their extreme lightness and incorrodibility by all chemical agents except a strong solution of bichloride of mercury.

The best self-retaining Sims's speculum which we have seen is that invented by Dr. Clement Cleveland of this city. The retracting force in this instrument is exerted by a broad band, with a buckle, passed over the shoulders of the patient, the fulcrum being the latter's sacrum.

Method of Introducing Valvular and Cylindrical Specula.—The patient being placed in position on the back, as already explained, and the speculum, probe, and whatever other instruments are to be employed laid in a basin of warm water at the bedside, the physician seats himself in a chair, or, if a low bed be used instead of a table, kneels or sits upon a stool. The finger, having been thoroughly lubricated with soap or carbolized vaseline, is passed up and the location of the cervix ascertained. The speculum, similarly lubricated, is then passed in this way: If the cylindrical instrument be used, the perineum is depressed by its tip, and it is very slowly and gently inserted and carried to the cervix; should one of the valvular varieties be employed, it is inserted closed and expanded after reaching the cervix. Both these specula may be used in the lateral (Sims's) position with equal facility.

Fig. 19.



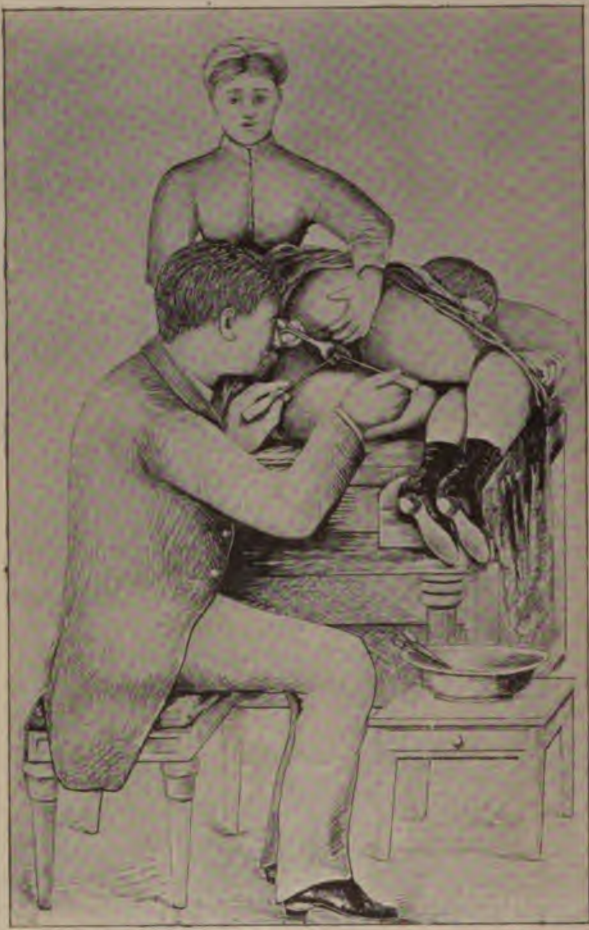
Cleveland's Self-retaining Sims's Speculum.

Introduction of Sims's Speculum and its Varieties.—In this method of examination the element which commands success is not the use of the instrument, but the position of the patient. If the position recommended by Sims be attained, exposure of the cervix will be easy; if a similar but not *identical* attitude be substituted, the examination will prove entirely unsatisfactory.

The object of the position is to allow the abdominal viscera to gravitate, so as to draw the anterior wall of the vagina forward in a direction opposite to that impressed upon the posterior wall by the speculum. To accomplish this the patient must not be on her back nor on her side, but in a position between the two. This is well represented in Fig. 20. The left arm must be drawn behind the patient, so as to let her rest on the left side of the chest, and the right leg be so flexed as to let the right knee lie just above the left.

When the patient is arranged the correctness of the posture may be tested by noting that the lower trochanter is not just opposite the upper, but nearer to the examiner by two or three inches. We are thus particular in describing this position—first, because it is difficult for one not accustomed to its employment to place his patient properly in it; and, second, because upon its *perfect* attainment depends the successful use of Sims's speculum. The patient being in position, the speculum is introduced, the posterior vaginal wall elevated by it, and the anterior depressed by the depressor, Fig. 16, held in the other hand.

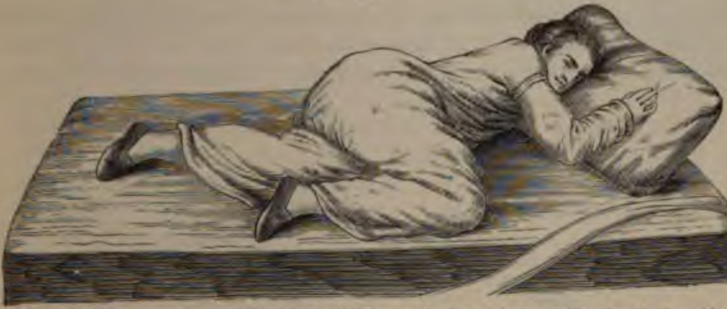
FIG. 20.



Position of Patient, Physician, and Nurse during an Examination with Sims's Speculum.

One reason why the great advantages of Sims's speculum were for a time not more generally recognized and acknowledged was unquestionably to be found in the fact that the patient was not properly arranged before its introduction. To impress this fact, and to show how faulty the arrangement of the patient may be, we introduce a diagram from a very excellent French work upon gynecological surgery. No diagram could better represent how the woman should *not* be placed than this.

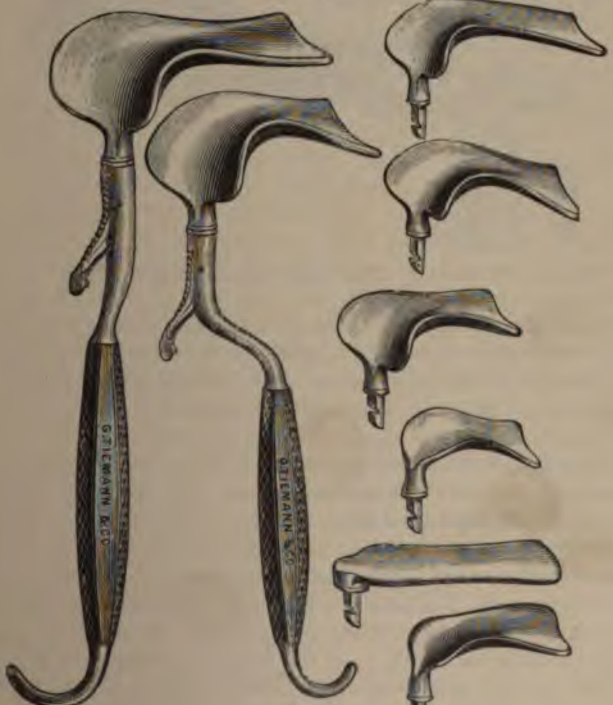
FIG. 21.



Incorrect Representation of Position of Woman in Examining with Sims's Speculum (Leblond).

A series of vaginal depressors and elevators, to be used solely in the lithotomy position was devised by the late Prof. Simon of Heidelberg, mainly for use in operations on the vagina and cervix: through

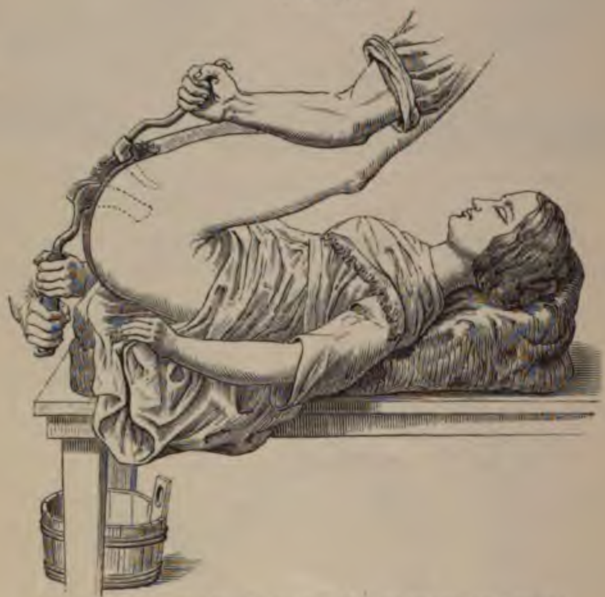
FIG. 22.



Simon's Specula: Blades of various sizes and shapes.

them he achieved his, at that time, marvellous results in curing vesico-vaginal fistulæ, prolapsus uteri, and lacerated cervices. Edebohls of New York has devised a modification of these instruments. Fritsch of Breslau has also constructed a very ingenious contrivance for supporting and steadying the legs of the patient and retaining the modified Simon's specula, but it is obvious that such complicated contrivances are not needed when one competent assistant can be procured to hold the Sims's speculum. We have found that, as a rule, wherever such operations are to be performed, sufficient assistance can readily be obtained free of expense, and trained gynecologists are by no means essential to hold a speculum or wash a sponge.

FIG. 23.



Simon's Position for Vesico-vaginal Fistula Operation (Simon).

THE UTERINE SOUND.—This valuable diagnostic means, although to a certain extent known in ancient times, was more recently recommended in 1828 by Samuel Lair.[1] It was not, however, adopted upon his recommendation, and it was not until about the year 1843 that it was generally accepted. At this time its claims were simultaneously urged by Simpson of Edinburgh, Huguier of Paris, and Kiwisch of Prague, working without concert. It matters little to which of them belongs the credit of having been the first to conceive the idea of the regeneration; to Simpson certainly belongs that of having forced it upon the attention of the profession and established its value by clinical evidence.

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[1] Samuel Lair, *Nouvelle Méthode de Traitement des Ulcères, Ulcérations, et Engorgement de l'Utérus*, 1828.

The instruments in general use are those of Simpson and Sims, which differ from each other in principle, the Simpson consisting of a stiff metal rod divided into quarter inches, flexible by pressure before its introduction ; and the Sims, a flexible silver-plated staff, thinner than the other. Practically, at present, the Simpson sound only is in use. The method of their introduction is: The index finger of one hand being introduced into the vagina and placed against the cervix, the sound is by the other slid upon its palmar surface to the os, passed into it, and by depression of the handle gently advanced to the fundus. If the uterus be in its normal position and the sound be used by a skilful hand, the operation is not difficult. But it is not the healthy uterus which we are generally called upon to explore. If the organ be displaced, the difficulties and dangers attending the employment of the sound are considerable.

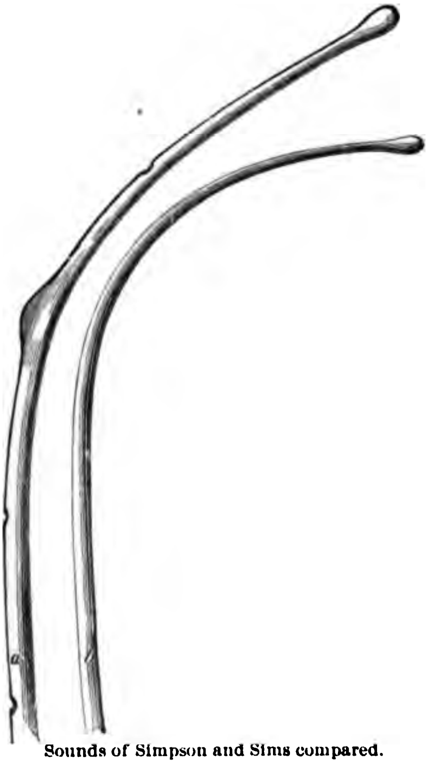
Precautions and Dangers.—In introducing the sound it is essential, above all, that no force whatever be used, and that, particularly when the point of the sound has passed the internal os, care be taken that it touch the fundus very gently, otherwise it might, in cases of flabby uteri, very easily pass through the fundus and enter the peritoneal cavity. This accident has occurred so frequently—indeed, we ourselves have within the last few years seen it happen in our hands under most gentle management in four cases, fortunately with no bad results (P. F. M.)—that we deem it proper to caution all beginners against this possible danger. Besides, the sound if roughly used may cause more or less severe hemorrhage from the uterus, and it has been known to set up a pelvic peritonitis. It is self-evident that, as with all other instruments used in gynecological examinations, the sound should be carefully cleaned and warmed in an aseptic solution before being introduced. Of course care should be taken never to insert the sound into a uterus which, from the history of the patient, may possibly contain a product of conception; that is, never to use the sound when the patient admits that she has missed one or more menstrual periods; nor should the sound be used if there is any record of pelvic inflammation, recent or remote, unless all traces have been found absent on a careful examination; and never under any circumstances to introduce the sound into the uterus until a thorough bimanual examination of the uterus and the other pelvic contents has demonstrated the absence of any contraindication to the instrument. The routine use of the sound is certainly to be condemned, but with a careful observance of the above precautions we do not think that it will often do harm ; and we have made it a rule in our practice for many years, when examining a patient for the first time, to assure ourselves of the exact condition of the endometrium by inserting the sound carefully and gently whenever the contraindications above mentioned were absent. We feel that the information thus obtained has by far outweighed the very rare injuries inflicted. We usually prefer to introduce the sound on the finger by touch only, as prescribed, instead of through the speculum, because the finger enables us more accurately to gauge the resistance offered to its passage and the direction in which to introduce it. Occasionally, however, finding this difficult, we are forced to introduce it through the Sims speculum. To pass a sound through a cylindrical or bivalve speculum is usually unsatisfactory, and perhaps even dangerous.

The facts which may be ascertained by the sound are these:

1. The capacity of the uterus ;
2. The existence of growths within it;
3. Deviations of the course of its canal;
4. Differentiation of displacements from uterine tumors;
5. The mobility of the uterus.

The great importance of these facts with reference to diagnosis is evident, and one would suppose that an instrument revealing so much would be universally employed. Such, however, is not by any means the case. Expert gynecologists can usually dispense with the sound, although at times it serves a purpose which is unattainable by any other means, and makes a difficult diagnosis easy. But to cast it aside entirely as useless, pernicious, and unnecessary, as is being done at present by some eminent authorities, seems to us unwise and uncalled for. The indiscriminate use of the sound by inexperienced hands should, however, certainly be condemned.

FIG. 24.



Sounds of Simpson and Sims compared.

The Sims flexible sound has fallen into disuse because it was found that it could but rarely be used without the speculum, bending as it did too easily on encountering any obstacle. In place of it Sims devised a thin, excessively flexible probe of pure silver, which is used only through the Sims speculum in the following manner:

Mode of Probing the Uterus.—While the woman lies on her back, the examiner, by vaginal touch, carefully ascertains the position of the uterus by passing his finger first into the fornix vaginæ over its posterior face, and then along the base of the bladder, over its anterior wall. This gives him a definite idea of the direction of the canal along which he is to pass his probe, and without it he should never essay the procedure. The speculum is then introduced, the patient being turned on the left side. The examiner then takes the probe, and with his fingers gives it the exact curve which he supposes the uterine canal to have, and gently endeavors to pass it in.

Should he fail, he withdraws the instrument, alters the curve slightly, and makes other attempts until he succeeds, which will be very soon if he has used this method so often as to have given himself experience. Every effort at introduction is made as cautiously as if the probe were passing into the larynx instead of the womb, and no force whatever is exerted. Success is attained by properly curving the probe, and by that alone. Sometimes the inflection given to it must be the arc of a small circle, at others a sharp angle; sometimes the instrument is left perfectly straight; in fact, every variety of direction may be given it. In a certain set of rare cases even a spiral twist is required.

Thus employed, the uterine probe becomes a means of verifying a diagnosis which has been made by touch, and is certainly safe, easy of introduction, and painless. It may be used in all cases except pregnancy, doing no injury even in endometritis, so gentle is its entrance into the inflamed cavity.

No one can dispute the fact that having been passed it performs the chief functions of the sound, proclaiming the course, length, and capacity of the uterine canal.

As the practitioner grows in skill in the practice of conjoined manipulation, that most valuable and reliable of all his means of diagnosis, he will less and less frequently find a resort to the sound or probe necessary. In the vast majority of his cases he will by that means so clearly determine all that the sound or probe could reveal that he will feel satisfied without further investigation.

Some cases of enlarged uteri, with or without the presence of submucous fibroids, require the use of an elastic sound for their full exploration. For this purpose sounds of gum elastic and whalebone have been employed.

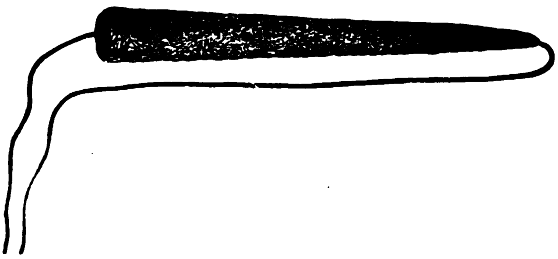
TENTS.—Before the time of Récamier, the cavity of the uterus was a space entirely closed to investigation and local therapeutics, unless the os were greatly dilated by disease. He, however, not only aspired to an accurate knowledge of its affections, but boldly applied his remedies directly to the diseased surface, and in cases of intra-uterine granulations scraped off the diseased mucous coat with the curette. Even to him, however, the diagnosis of diseases within the cavity when the os was closed was an impossibility, and for the means of combating this difficulty we are again indebted to Dr. Simpson, who in 1844 placed the use of sponge tents among the most important of our resources for diagnosis.

The object for which they are employed is the dilatation of the cervical canal, in order that the cavity of the body may be examined by touch or sight, and that treatment may be applied in cases of polypi, granulations, fibrous tumors, hydatids, removal of the products of conception, etc.

Various substances have been recommended for the manufacture of tents, only three of which have thus far come into general use—compressed sponge, laminaria digitata, or sea-tangle, and tupelo, or the compressed root of the *Nyssa aquatica*.

All these tents are now prepared at wholesale by manufacturers. No practitioner would think of making them himself, or need do so, no matter where he lives. They may be medicated with iodine, zinc, copper, or other substance, but are at present used almost exclusively to dilate the uterine canal, such local medication as may be deemed neccssary being applied after their removal. A cord is passed through the outer end of the tent in order to facilitate its removal.

FIG. 25.

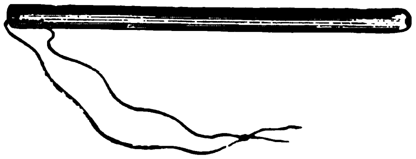


A Sponge Tent, with thread passing through it.[1]

Preparation of Sea-tangle Tents.—In 1862,[2] Dr. Sloan of Ayr, Scotland, first recommended the use of this substance for dilating the cervix uteri. The laminaria is an aquatic plant found upon various parts of the Atlantic coast of Europe and America. That found in the Bay of Fundy is far superior to any other in the market. This plant, when saturated with moisture, swells to three times the bulk which it has when thoroughly dried. In its moist state a long piece of it is perforated at both extremities, in order that it may be hung up and allowed to dry, a weight being attached to the lower end, so as to stretch it and make it straight. When dry, this is cut into pieces from two to two and a half inches long, and made perfectly smooth and round by a lathe or knife, a piece of glass, or sandpaper.

Dr. Greenhalgh of London has improved these tents by having them perforated from one extremity to the other, so as to make them tubular instead of solid. Thus prepared they will dilate much more rapidly and completely. One of Dr. Greenhalgh's tents is represented in Fig. 26.

FIG. 26.



A Sea-tangle Tent.

The advantages of these tents over those made of sponge consist in their creating no fetor and presenting no animal matter for absorption. Their disadvantages are their requiring a longer time for expansion, their being kept in the cervix with greater difficulty, and offering a harder substance to the walls of the cavity of the uterus.

The Tupelo Tent.—About fifteen years ago Dr. George E. Sussdorff of this city introduced to the notice of the profession a tent made of the wood of the tupelo tree, or *Nyssa aquatica*, growing throughout the swamps of the Southern States; the natural root was compressed by machinery and then smoothed and polished. It has the advantage over laminaria in coming in sizes varying between that of a knitting-needle and that of the middle finger. It expands more rapidly, equally thoroughly, more uniformly, with less constriction at the most difficult point of dilatation, the internal os, and coming in so much larger sizes than the laminaria can of course produce more thorough dilatation. It can be rendered equally aseptic with the laminaria, and, what is a great advantage, can be easily whittled into the proper size and length, whereas the hardness of the laminaria may resist even the sharpest pocket-knife.

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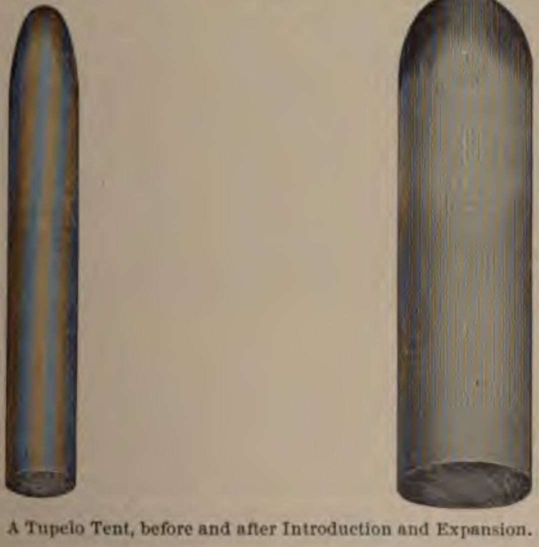
[1] The extremities of this thread should of course be tied together.

[2] *Glasgow Med. Journ.*, Oct., 1862.

Comparative Advantages of the Sponge, Laminaria, and Tupelo Tents.—Sponge tents, formerly almost universally used, are now but very little heard of, having been almost completely supplanted by the tupelo, which latter is not only much more easy of introduction and much less liable to become offensive and produce peritonitis or septicæmia, but expands with almost equal rapidity and thoroughness; besides, the tupelo is more easily removed, and does not bring away with it a large portion of the uterine mucous membrane. The laminaria tent, being seldom found larger than a small-sized lead pencil, cannot of course bring about the same amount of dilatation as the larger tupelo. It is true, a number of laminaria tents can be introduced side by side at the same time, and will then secure a very efficient dilatation, but it is not always easy to introduce several tents at once through a narrow uterine canal, and their habit of becoming

FIG. 27.



A Tupelo Tent, before and after Introduction and Expansion.

twisted and contorted on expansion, and of being much constricted at the internal os, renders their removal often exceedingly difficult.

Fig. 27 represents one of these tents before introduction in a case of a patient suffering from a submucous fibroid, and the same upon removal at the end of twenty-four hours. The figures are of natural size.

Mode of Introducing Tents.—A tent is best introduced through a speculum, preferably the Sims. Before the introduction of the tent the vagina should be syringed out with carbolized water, or, better, mopped out with a 1 : 10,000 solution of bichloride, and the tent, having been lubricated with carbolized vaseline and grasped by a pair of forceps, is directed in coincidence with the uterine axis, as ascertained by the probe, and gently pushed through the cervix.

After this the vagina should be again cleansed as before, a mass of carbolized cotton packed against the cervix, so as to exclude atmospheric air and keep the tent in place, and the woman be directed to remain in bed until it is removed.

Its withdrawal is accomplished through the speculum, after removal of the cotton and syringing with carbolized or bichloride water, in from twelve to twenty-four hours, with the same forceps by which it was introduced or by traction upon the thread attached to it.

Dangers.—There is always danger in dilating the cervix by tents, though it is by no means so great as to make one hesitate in employing them, for the cases which demand them are often urgent ones, and they serve a purpose not attainable by any other means. It is much to be regretted that practitioners have not shown more alacrity in publishing unfortunate results from the use of this method of exploration and treatment. Had all the fatal cases which have resulted from accidents due to tents been faithfully recorded, the list would now be a long one, and it would be greatly lengthened by a record of all the instances in which tedious, exhausting, and dangerous disease has thus been excited. It may then be asked whether it is right to recommend a method accompanied by so much danger. The same line of argument applies to this question which does to so many similar ones in medicine. Great dangers attend the use of anæsthetics, of narcotics, and of other means which are in daily use, but the *proportion* of accidents occurring from their use is small, although the aggregate is large, and the good which they effect is so great that their evils must be condoned.

[In my own practice I have met with four fatal cases resulting from the use of tents. In one they were employed to remove a fœtal shell which had been retained for two months and was destroying the patient's life by septicæmia; in the others the cervix was being dilated for the removal of fibrous polypi, the hemorrhage from which had greatly exhausted the patients. One of these women died from tetanus, one from peritonitis, one from an overwhelming and sudden attack of septicæmia, and one from sloughing of a fibroid and chronic septicæmia.

Some time ago I was called in consultation to the bedside of a lady who was dying of general peritonitis, which had arisen one week after the removal of a sponge-tent employed for dysmenorrhœa by her physician, who was a most careful and competent practitioner. Besides these cases, I have seen, as has every other gynecologist who has employed this means to any extent, a number in which the following affections have been excited by tents: pelvic peritonitis, peri-uterine cellulitis, septicæmia, endometritis, and hematocele.—T. G. T.]

[I have seen a similar experience, within the last two years, of death from general peritonitis after a succession of tupelo tents, where I was fortunately able, by my testimony before a coroner's jury, to secure the acquittal of the physician.—P. F. M.]

This is the record of our own practice, and our observation of that of many of our friends whose results we have had an opportunity of seeing exactly agrees with it. Let it be remembered that many of the operations of gynecology are performed after dilatation of the cervix by tents. A fatal result ensuing is commonly attributed to the operation. With our experience we cannot doubt that the preparatory dilatation is accountable for it in many cases.

In view of the great suddenness with which the dangerous symptoms which follow the use of tents develop themselves, we feel confident that they are due to the formation of a septic infection, the germs of which probably came from without, and which spreads to the peri-uterine cellular tissue and adjacent peritoneum by means of the lymphatics, exciting both septic peritonitis and general septicæmia. We will not deny the possibility of the infection spreading from the endometrium through the Fallopian tubes in some cases.

This subject is one of so great importance that we deem it best before leaving it to enumerate certain rules which should always govern the practitioner who resorts to this valuable, but at the same time unquestionably hazardous, method of diagnosis and treatment:

1st. In the introduction of a tent no force whatever should be employed. Should that first essayed not pass the os internum easily, it should be at once withdrawn, and either bent so as to follow more accurately the course of the cervical canal as ascertained by the probe or exchanged for a small tent.

2d. A tent should never, under any circumstances, be introduced at the physician's office and the patient allowed to go home with it *in utero*. Such practice is hazardous in the extreme. Even when introduced at the patient's home, she should at once be confined to the recumbent posture and kept perfectly quiet. The tent should be covered with carbolized vaseline.

3d. The practitioner should always investigate as to the previous existence of chronic pelvic peritonitis or cellulitis, two of the most common of the diseases of women. Should they have existed, tents should be carefully avoided. In most of the instances in which we have seen dangerous results follow their use one of these conditions had previously existed and been excited into activity by them.

4th. A tent should never be allowed to remain in the uterus more than twenty-four hours, and if it be compatible with the accomplishment of the desired result it should be removed in twelve hours.

5th. Just before and just after the removal of a tent the vagina should be washed out with an antiseptic fluid, and if any pain, chilliness, or discomfort follow the removal, opium should be freely administered and perfect quietude enjoined.

6th. After removal of a tent the patient should be kept in bed for at least twenty-four hours, and never allowed to travel before the expiration of four or five days.

We are fully aware that these precautions will be incredulously received by those practitioners who have habitually and with impunity inserted tents at their offices and sent the patients home with directions to remove them, by means of the cord, on the next day. But it is the duty of every conscientious man to give weight to the experience of others. If it were essential for every practitioner to lose one patient from this or any kindred cause before regarding it as really dangerous, the number of fatal cases would necessarily grow very large.

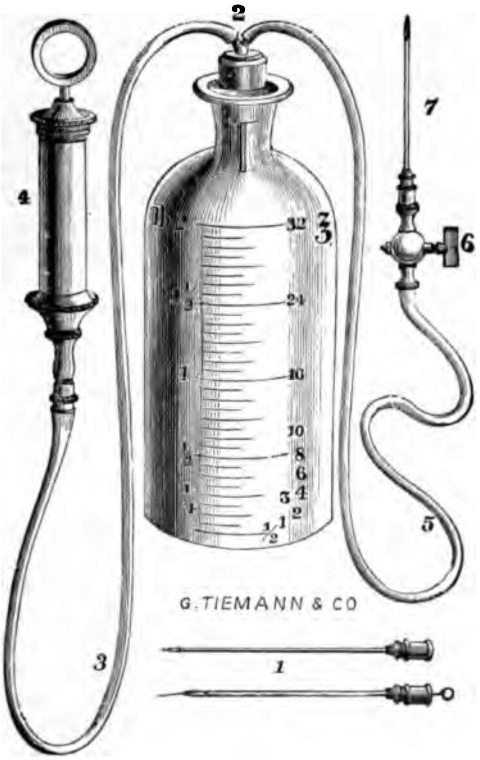
[NOTE. Since the last edition, Dr. Thomas's position in regard to tents has changed to such a degree that in a communication on the subject received from him after this chapter had gone to press he says: "Tents of all kinds should be discarded in gynecology, absolutely and completely. Dilatation of the os and cervix uteri can be more certainly and safely accomplished by rapid dilatation by the divulsor, under anæsthesia and careful antisepsis, and should always be practised by preference." I personally am not prepared to go as far as this, and should be sorry to be compelled to part with the tupelo tent in certain cases where a *gradual*, *slow*, and *thorough* dilatation is desired. Sponge and laminaria I have not employed for years. Feeling that a sweeping condemnation of tents in gynecology would scarcely meet with the approval of the profession, and believing, as I do, in their limited utility, I have thought it my duty to endeavor to instruct the practitioner how to use them with as little risk as possible, and have therefore retained this section.—P. F. M.]

THE DULL CURETTE.—In cases where profuse menstruation or an offensive discharge from the uterus leads one to suspect the presence of small vegetations or polypoid degeneration of the endometrium, or possibly malignant disease, the dull curette may be passed up into the uterine cavity, and the latter gently scraped by repeatedly drawing the instrument from the fundus down to the internal os. The discharge which then always escapes from the external os, on being mopped up with cotton in a dressing-forceps and examined by the eye, will frequently show the presence of small shreds or bits of tissue of the size of a canary-seed—namely, the adenoid degeneration referred to, which is the cause of the menorrhagia. The diagnosis is thus made by the curette, and the treatment will consist in a thorough removal, by the same or a more powerful instrument, of all the diseased tissue. If the curette removes other shreds of a different appearance, which under the microscope prove to be malignant, the diagnosis has likewise been made by the instrument. Another variety of adventitious tissue which may also cause bleeding or offensive discharge is that left behind after a confinement, usually a miscarriage—namely, a portion of the placenta or ovum; and here, too, the dull curette affords a valuable if not indispensable means, not only of making a diagnosis, but also of removing the offending substance. A larger curette with longer handle, the whole instrument measuring sixteen inches in length, is used for this latter purpose.[1]

The Exploring Needle.—By means of a long delicate needle or very narrow tube, constituting a canula for a trocar the size of a small knitting-needle, the contents and characters of tumors in the pelvis may be ascertained. These instruments are not employed in treating cysts, but are required only to remove sufficient fluid to announce the character of the contents of the tumor. Sometimes a tumor supposed to be solid and irremediable is thus proved to be amenable to treatment.

The Aspirator.—To whom belongs the credit of originating this method of evacuting the fluid contents of tumors or cavities we are unable to say. M. Courty alludes to it as a method of emptying ovarian cysts in use ten years before the appearance of his work, and mentions the instruments employed for that purpose by Buys, Monro, Guérin, and Boinet. To Dieulafoy and Potain of Paris certainly belongs the credit of systematizing and popularizing it to such an extent that

Fig. 28.



Potain's Aspirator.

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[1] See Mundé: "The Immediate Removal of the Secundines after Abortion," *Amer. Journ. Obstetrics*, Feb., 1883.

it must be looked upon as a great resource, not only for the diagnosis, but also for the treatment, of many of the morbid states with which the gynecologist is called to deal.

This method consists in the introduction of very slender, long needles, perforated by a capillary tube, into tumors in regard to the characters of which it is desired to decide; connecting these by gutta-percha tubes with a glass cylinder in which a powerful piston plays very accurately; and creating a vacuum in this by drawing the piston upward. Powerful suction is thus exerted upon the material in the cavity penetrated by the needle, and, if it consist of fluid not too tenacious to flow through so small a needle, it passes through the tube and enters the cylinder. Such instruments, very perfectly constructed and more or less simplified, can now be obtained of the instrument-makers of any city.

One great advantage possessed by this instrument consists in the fact that the needles are so delicate that the intestines, the bladder, solid tumors, or even important secreting organs, may be penetrated without great danger. The sac imprisoned in intestinal hernia, the large intestine distended by gases, the bladder threatened with rupture through impassable stricture, have all been tapped by it with impunity.

Should the operator not have this instrument at his disposal, the same principle may be applied to diagnosis by the use of the ordinary hypodermic syringe, as suggested by Dr. H. F. Walker, and sufficient fluid obtained for chemical and microscopical examination.

This method of exploration may be applied to all pelvic and abdominal tumors with the best results.

In the use of the aspirator too much care cannot be observed as to cleansing the needles before introducing them. The fluid of ovarian cysts is often withdrawn by them, then the needle used is carelessly washed, put aside, and again used, at the infinite risk of contamination of another patient. Not only should the needles be scrupulously cleansed after, but before, being used, and immediately before introduction they should be dipped in a carbolized solution. The best means of ensuring their absolute cleanness is to heat them thoroughly in a spirit-lamp just before using them.

THE MICROSCOPE.—The microscope will often prove useful as an aid in diagnosis in determining the malignant nature of certain morbid growths, the character of products of inflammation, the connection of an intra-uterine growth with conception, the purulent nature of uterine leucorrhœa, and the deleterious effects of uterine discharges upon the zoosperm in the production of sterility. In several cases of obstinate metrorrhagia dependent upon an unascertained cause we have been able, through cervical dilatation and the use of the curette, to obtain material sufficient for a positive diagnosis of sarcoma or cancer of the body by this instrument.

[One case has come to my knowledge in which many of the symptoms of cancer of the body existed, but in which the error in diagnosis thus created was corrected by a removal of a portion of the supposed morbid growth and examination by the microscope. By this instrument the substance was pronounced to be not cancer, but sponge, and further investigation proved that one-half of a sponge tent had remained in the body of the uterus for several months. A similar case has been reported to me in which a piece of cotton was long retained, giving rise to very anomalous symptoms. A portion being removed, the microscope revealed its true nature.—T. G. T.]

Foulis and Thornton have pointed out the important fact that examination of the abdominal effusion accompanying cancer of the ovaries reveals the cancer-cell and leads to a correct diagnosis; and Drysdale has proved the great value of the microscope in examination of ovarian fluids and the determination of the diagnosis by them.

AUSCULTATION AND PERCUSSION.—The important assistance of auscultation and percussion in mapping out the size of tumors, determining pregnancy, differentiating this from ovarian cysts, etc., is so evident as merely to require a passing mention.

RECAPITULATION OF MEANS FOR EXPLORING THE VISCERA AND TISSUES OF THE PELVIS.

1st. Vagina and Cervix:

Vaginal touch;
Sight, through the speculum;
Conjoined manipulation.

2d. Outer Surface of the Uterus:

Vaginal and rectal touch, while the organ is brought within reach by hypogastric pressure or the tenaculum;
Conjoined manipulation;
Vesico-rectal exploration;
Simon's method.

3d. Cavity of Cervix and Body:

Tents, followed by introduction of finger;
The uterine probe and sound;
Removal of substance by curette and use of microscope.

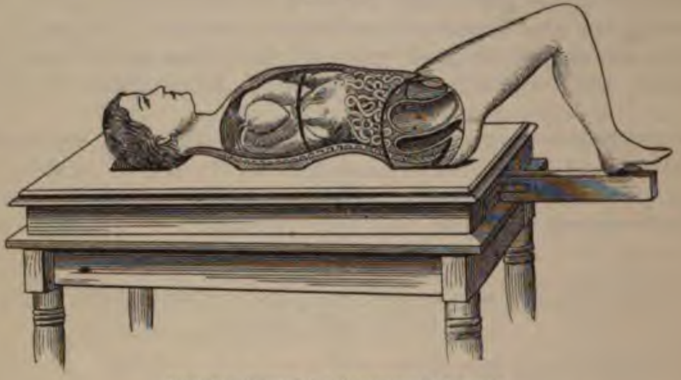
4th. The Ovaries, Tubes, Broad Ligaments, Pelvic Peritoneum, Pelvic Areolar Tissue, and Ureters:

Vaginal touch;
Rectal touch;
Simon's method;
Conjoined manipulation;
Abdominal palpation;
Auscultation and percussion;
The exploring needle;
The aspirator.

[It is so difficult for a teacher to give instruction to a class upon the subject of diagnosis of the diseases of women that I am induced by that consideration to give a representation of a manikin figure which has given me great satisfaction in this connection.

This figure is made of thick board, painted to resemble the human female, the legs being articulated, and the whole fixed to a table like that represented in Fig. 8. Upon the part representing the trunk all the abdominal, thoracic, and pelvic organs are painted except the uterus. In place of this a peg or pivot is fixed, and upon this uteri, of all shapes and sizes, flexed, with tumors, enlarged, inverted, etc., may be fixed to illustrate cases presenting themselves clinically. After examination on the back, the figure is placed in Sims's position, the table elevated at one side, and the speculum and sound are employed. The sense of sight is made to supplement that of hearing, and instruction is made clearer by this means.—T. G. T.]

FIG. 29.



Manikin Figure for Teaching Diagnosis.

CHAPTER VI.

ELECTRICITY AS A THERAPEUTICAL AGENT IN GYNECOLOGY.

ELECTRICITY as an agent in the treatment of various diseases of the female pelvic organs has attained such prominence during the past decade that we have thought it proper to devote a brief chapter to its discussion. It is true there are still many gynecologists who do not believe in its particular efficacy, partly because they have either had no experience with it or because many of the most startling results have been reported by gentlemen who were not gynecologists, but electricians, or, better, electrologists, who possibly may have been mistaken in their diagnoses and in the results which they claimed to have obtained. Still, we feel confident from our own experience that we have in the two varieties of the electrical current most potent agents for relief from suffering, and perhaps even cure, in many cases of pelvic disease in the female. As is well known, these two varieties of electricity are the faradic or interrupted and the galvanic or constant current. Both differ decidedly in their indications for use and in their effects on the human system.

The faradic current, as a rule, may be considered to be an irritant, a stimulant, a promoter of increased vascular action in the parts through which it passes. In certain cases it is true, however, that it acts as a sedative and allays pain. The faradic current, therefore, will usually be indicated in cases where it is desired to increase the vitality, the growth, the blood-supply of an organ. On the whole, the faradic current has, in our experience, a far more limited application than the galvanic current in the treatment of the diseases under our consideration.

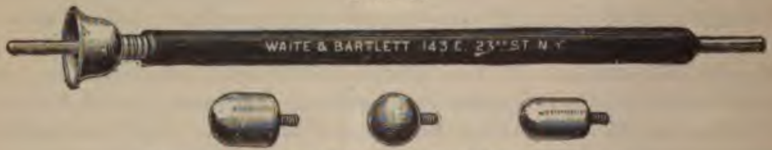
The galvanic current is chiefly indicated where it is desired to produce a sedative, an alterative, or an absorbent effect upon the tissues, and therefore will be employed in conditions where it is essential to melt away tissue which is in excess or is the result of old inflammatory processes.

Use of the Faradic Current.—For the ordinary necessities of gynecological practice we have found the well-known Kidder tip battery to answer every purpose. Faradic batteries made by other companies, however, do very well, and we have no desire to claim any preference for one kind of instrument over another. Two cords with round sponges attached to universal wooden handles, a copper or steel properly insulated uterine sound, and a ball electrode for use in the vagina, constitute about all the apparatus that is needed for the proper application of the faradic current to the female sexual organs. Specialists in electro-therapeutics have devised numerous other complicated instruments for the passage of the current in different directions through the uterus, ligaments, vagina, and rectum; but we confess that we have not found it necessary to go into such details in order to achieve satisfactory if somewhat limited results.

The diseases in which the faradic current will be found useful are the following: deficient development of the uterus and ovaries, amenorrhœa, subinvolution, menorrhagia, superinvolution, uterine displacements, uterine fibroids (interstitial and submucous). In all these diseases it should be distinctly understood that only perseverance and a thorough trial of the treatment will result in benefit, if indeed such is to be achieved by this method. The action of the faradic current in deficient development of the uterus and ovaries, amenorrhœa, and superinvolution is to stimulate the organs to increased growth by local irritation and by augmenting their supply of blood. In subinvolution and uterine fibroids the current acts by contracting the uterus—in the one case with the object of restoring it to its normal ante-pregnant condition; in the other of either interfering with the nutrition of the fibroid by its compression between the muscular fibres, or possibly by forcing the tumor into the uterine cavity and eventually out through the external os. Sittings should be given at least every other day—better every day—from five to fifteen minutes each, the current used being as strong as the patient can support. The internal electrode should usually be the sound, and the external a sponge placed over either the fundus uteri on the abdomen, or over each ovarian region alternately, as the cases may demand; or the current may also be passed through the sacral and lumbar portions of the spinal cord, by means of a large flat sponge on the back, in case it seems desirable to excite these nervous centres. In displacements of the uterus the electrodes should be so placed as to pass the current through the ligaments and muscles which it is desired to excite to contraction or to strengthen. In cases of prolapsus of the uterus and vagina some operators have reported good results from the use of a finger-shaped metal electrode in the vagina, by means of which the vaginal walls were contracted and restored to their original tone. The faradic current has been of particular service to us in cases of irregular (infrequent) and scanty menstruation, due either to torpidity of the ovaries and uterus or to an imperfect development of those organs. We have thus seen sterile women who menstruated only every three or four months, after a treatment of several months with the faradic current, as above described, begin to menstruate regularly, and eventually to conceive. The same agent has also been fairly successful in our hands as an aid to the expulsion of submucous fibroids in conjunction with the steady use of ergot and repeated dilatation by tupelo tents.

The Constant Current.—For the constant current we use a stationary battery of either forty or sixty Leclanché elements, or if the agent is to be used outside of our offices and sanitariums, a thirty-six-cell battery constructed on similar principles. So many of these instruments are now made by different manufacturers with various arrangements for office use that we will not attempt to influence the choice of one particular battery over the other; we have found those, however, made by Waite & Bartlett of New York to answer all our requirements. Besides the battery, there are required a galvanometer or milliampèremeter graduated to a scale of at least 250; further, a Bailey rheostat, through which the whole current is passed, its strength being controlled by the gradual depression of the carbon plate of the rheostat into water, the number of milliampères being marked on the galvanometer. In this way all interruptions of the current from the old method of moving the indicator forward from cell to cell are avoided—a matter of great practical importance and saving of much pain to the patient. Further, a steel or copper properly insulated sound; a metal ball electrode for the cervix and vagina, to be covered with absorbent cotton when used; a couple of large flat sponges for use on the abdominal walls or the sacrum; four or five silk-covered

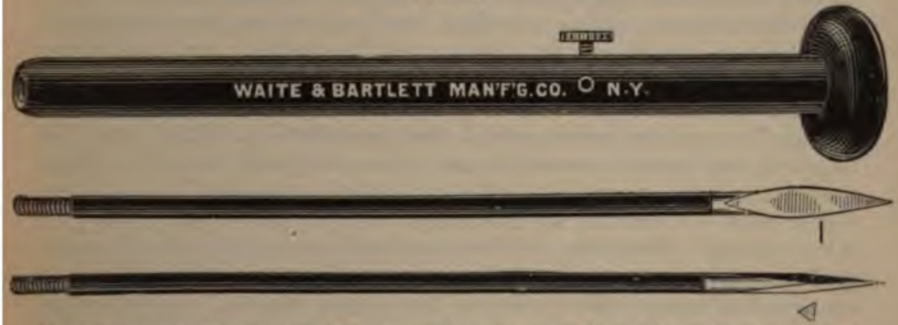
FIG. 30.



Vaginal and Cervical Electrodes, with Universal Handle.

wire cords; and perhaps a cup electrode for the cervix uteri, complete the usual outfit. If the electrolytic treatment is to be employed for uterine fibroids, a sound, of which at least two and a half inches are composed of platinum, the rest properly insulated, several lance-shaped, properly insulated needles for vaginal galvano-puncture, and a large flat pad of clay, two feet by one, contained in a linen bag, will be required. These latter instruments are thus used and recommended by Apostoli of Paris, but they are now made by nearly all instrument-makers, with more or less modifications and improvements. It is not very difficult to learn the construction and management of these batteries and instruments, and by no means requires a skilled and practised electrician in order to know how to use them intelligently and with benefit to the patient. But, a certain amount of experience is undoubtedly necessary in order to know exactly in what cases the treatment is likely to be beneficial or where it may do no good, or even be injurious, and of course the operator must know when his battery is not doing its work properly—a fact which is very easily ascertained in the faradic battery by the weakness of the current as experienced by the patient, and in the galvanic battery by the failure of the milliampèremeter to record the number of milliampères which a certain number of cells have been known before to give. The galvanic battery particularly needs more or less frequent refilling and cleaning. The so-called storage-batteries which are used for electric lighting and motion are, we believe, so constructed that they can be left alone for a long period and yet still retain all their power, and many electro-therapeutists have these batteries connected with their office-indicators and use them for treatment.

Fig. 31.



Mundé's Lance and Spear-pointed Needles, with Handle, for Vaginal Electro-puncture (natural size).

In the faradic current it makes no difference practically which pole touches the internal organ or the skin. With the constant current, however, this is a matter of very great importance, which will be readily understood when we state that the positive pole exerts a soothing, sedative, hemostatic influence, whereas the negative pole is irritating, alterative, and caustic. As a rule, therefore, the positive pole is used in the uterine cavity and the negative pole on the skin. Further, whereas with the faradic current the sensations of the patient will be the almost exclusive sign for the limitation of the strength of the current, with the galvanic current the strength of the application is gauged in all cases where a gentle, soothing, and alterative effect alone is desired, partly by the sensations of the patient and partly by the galvanometer; in the other instances, where a powerful electrical or absorbent action is intended, the current will be given very much stronger, its intensity being then measured entirely by milliampères, often going as high as 250 ma., which will be more than most patients will be likely to stand except under anæsthesia. This applies chiefly to the electrolysis of fibroids.

Diseases in which Galvanism is Indicated.—Hyperplasia uteri; chronic ovaritis and pachysalpingitis; chronic cellulitis and peritonitis and lymphadenitis; pelvic neuralgia, local and reflex; dysmenorrhœa, neuralgic and obstructive; erosions of the cervix; subinvolution; uterine fibroids.

In hyperplasia uteri, if the object is to reduce the size of the uterus and bring about absorption of the hyperplastic areolar tissue, the negative pole should be used in the uterus, the positive on the abdomen; but if the object is to relieve the local and equally distressing reflex pains so common in this affection, the positive pole should be intra-uterine. In chronic oöphoritis and pachysalpingitis (pachysalpingitis meaning hyperplasia of the wall of the tube as the result of acute and subacute inflammation of the organ), the positive pole should be a metal ball electrode covered with absorbent cotton and applied to the vaginal vault of the affected side, the negative on the abdomen. The current, being chiefly used to relieve pain, and *perhaps* eventually, in recent and not very severe cases, produce an absorption of the adventitious tissue, should never be so strong as to give rise to pain; on the contrary, it should soothe and relieve. We have seen many such patients, suffering acutely when they entered our office, leave it absolutely free from pain after a fifteen minutes' treatment with the galvanic current at a strength of from 15 to 20 ma. Of course this benefit was but temporary, but even that small amount of relief was gratefully welcomed by these patients, to whom the dread of the otherwise inevitable operation was ever present. We know of one case certainly in which this treatment, continued without interruption for over three months, together with the use of iodine to the vaginal vault and blisters to the ovarian regions, resulted in a complete and permanent cure of as distinct and decided a salpingo-oöphoritis as we ever saw (P. F. M.).

Chronic pelvic cellulitis and peritonitis, pelvic neuralgia, local and reflex, pelvic lymphadenitis and lymphangitis,—in all these three conditions the local and reflex pains are mostly due to inflammatory indurations and adhesions of the tissues involved. The vaginal roof is hard and rigid, the uterus immovable, perhaps displaced, and the uterine ligaments tense and inelastic. If not of too long duration, and particularly if the exudation represents a distinct swelling, the galvanic current may effect decided results. As usual, the positive pole should be placed at the spot where the pain is felt, which is in the vagina (the metal ball is covered with absorbent cotton in order to prevent its burning the mucous membrane; for even the positive pole, if strong currents are used or the applications are frequently repeated, will produce an eschar unless the metal is covered with some protective substance). We have seen a most intractable and excruciating sciatica, resulting from the pressure of a pelvic exudation, entirely cured in three sittings by the galvanic current with the positive pole in the vagina, the negative on the hip over the ischio-sciatic foramen. The negative pole, first used internally in this case, only aggravated the pain (P. F. M.).

In obstructive and neuralgic dysmenorrhœa the galvanic current should be used by means of a sound (positive pole in the neuralgic, and negative pole in the obstructive, variety) in the uterus, and the other pole on the abdomen. In the obstructive variety, where it is desired to render the canal patulous and to keep it so, a stronger current would probably be required than in the neuralgic form, where the object is merely to soothe and relieve pain. Erosions of the cervix in nulliparous women we have occasionally seen benefited by placing the *uncovered* metal ball of the negative electrode against the erosion, the positive pole on the abdomen, and passing a current of from 30 to 50 ma. for ten to fifteen minutes.

It must be understood that the use of the galvanic current in all of the above-mentioned affections will be practically without avail unless it is carefully, scientifically, and systematically used for at least several weeks, perhaps even several months. As a rule, a few applications will neither benefit nor injure. Once in a while we meet with a case of chronic pelvic inflammation where the galvanic current aggravates the pain and has to be abandoned.

We come now to the consideration of the use of the galvanic current in fibroid tumors of the uterus—a subject which, thanks to the indefatigable efforts of its originator, Apostoli, and his disciples, has during the last few years excited more attention than any one other gynecological topic. His treatment consists in passing through the uterus and tumor, by means of a pure platinum sound inserted into the uterine cavity (positive pole) and a large wet clay electrode on the abdomen (negative pole), a current of galvanic electricity varying from 50 to 250 or even more milliampères. This treatment is to be repeated as often as the patient can bear it, each sitting extending from five to ten minutes, according to the strength of the current, and at least from thirty to fifty sittings being given before a positive result is to be expected. By means of this treatment he claims not only to arrest hemorrhages and relieve pain, but also to reduce in very many instances the size of the tumor, and even in a certain proportion to bring about its entire absorption. We have visited his clinic, and, judging by plaster casts of cases which he showed us, made when the treatment was begun, and the size of the tumors at our visit, we cannot deny that his statements are based upon facts. We have ourselves employed the method in a sufficiently large number of cases to be able to judge of its value: but, while we have certainly seen the bleeding more or less controlled and the pain very much relieved, we cannot speak in equally favorable terms of our results in reducing the tumors. We think that the method has undoubted advantages—that it will in all probability do good in very many cases, particularly of soft interstitial myomatous growths, chiefly by controlling bleeding and relieving pain; but we doubt very much whether it will prove to be of decided and permanent benefit in securing the absorption and entire cure of these growths.

It has a few dangers—namely, the possibility of producing peritonitis and of causing intra-uterine sloughing and septicæmia, several cases of which have been reported as due to this treatment.

The method has found many enthusiastic advocates, among whom may be mentioned so great a hysterectomist as Thomas Keith, and is being tested in this country with great thoroughness and zeal by many prominent gynecologists and electrologists. We must wait for further and more extended reports, not only as to immediate results, but as to the permanency of such results, before considering the question entirely settled.

As long ago as 1876, Cutter and Kimball of Massachusetts reported a series of cases in which they performed electrolysis of fibroid tumors by piercing the growth through the abdominal wall with two large gutter-shaped daggers. They had some excellent results, perfect cures, but they had more failures and a not inconsiderable proportion of deaths from this treatment. Nowadays only the more venturesome members of our profession indulge in this abdominal galvano-puncture.

We ourselves have many times punctured such fibroid tumors as were safely reached through the vagina with lance-shaped needles insulated up to within one inch of the point, passing one needle about two inches into the tumor and using the positive pole, with the negative pole as a clay pad on the abdomen. The patient was usually anæsthetized, and a current up to 250 ma. was passed through the tumor for at least five minutes. By this method we have absolutely cured five large both hard and soft tumors, which, at periods varying from one to two years after cessation of the treatment, were found to have entirely disappeared. The number of punctures varied from two to six, given at intervals of one week under the usual careful antiseptic precautions, the patient being kept in bed for at least two days after each application, with an ice-bag on the abdomen. In one case, it is true, sloughing of the track of the needle-punctures took place, with subsequent sepsis, which required free incision and curetting of the sloughing cavity; after this the patient rapidly improved, and the tumor was found six months afterward to have entirely disappeared. The sloughing may in this case have had something to do with the absorption. In another case during the past winter the electro-puncture produced a large abscess in the tumor, which was opened by the vagina. For a time the tumor diminished, but at last accounts was again growing rapidly. But the patient's health had greatly improved.

The number of fibroid tumors in which this vaginal puncture is practicable must necessarily be more or less limited, and care must be taken before introducing the needle to ascertain the position of the bladder by exploring it with the sound. We have seen one instance of a vesico-vaginal fistula produced by a slough from the needle, which was introduced too close to the wall of the bladder by a general practitioner. We had the pleasure of eventually closing the fistula. We consider this method by far more powerful and more likely to cause absorption of the tumor than the plain intra-uterine or true Apostoli treatment. It is, of course, also more risky, for the reasons already adduced; but still, in favorable cases, we think it worthy of trial.

Our confidence in the use of electricity for the diseases mentioned in this chapter is based upon an experience of nearly twenty years, during which time we have, of course, learned to use it more scientifically, more carefully, more intelligently, especially since we have been able to dose the current accurately by the help of the galvanometer; and while we may not be inclined to place as much faith in its curative properties in cases of old pelvic inflammatory conditions as we used to do, now that laparotomy has shown us how safely and speedily we can cure diseased appendages with the knife, we are still not inclined to retract substantially what we have written on the subject in past years.[1]

CHAPTER VII.

CONGENITAL AND INFANTILE MALFORMATIONS OF THE FEMALE SEXUAL ORGANS; HERMAPHRODISM.

MANY cases of disease are due to congenital malformation of the ovaries or uterus, or to deformities arising from arrest of or disproportionate development during girlhood. Up to the period of puberty the uterus, ovaries, and vagina are unimportant organs in the female economy. At that time they rapidly develop and immediately assume most important relations. During their period of insignificance, even if the most striking malformation exist it produces no evil result, and, unless some accidental circumstance reveal it, is not recognized or even suspected. Puberty arrives, the girl becomes a woman, and all is changed. Upon the efficient performance of the functions of ovulation and menstruation are, for the next thirty or thirty-five years, to depend in great degree the health, the usefulness, and the happiness of the woman.

Preparatory to the performance of these functions the pelvic viscera have been steadily though very slowly developing, and now with great suddenness an important duty is thrown upon them. If during uterine life their development has been defective, or if during the period intervening between birth and puberty they have either not sufficiently grown or have grown in such a manner as to be misshapen, then are they incompetent to the performance of the duties required of them, and certain diseased conditions are the result.

We shall consider only the most important of these, and it must be borne in mind by the student that their importance must not be estimated by the possibility of their relief. The recognition of the fact that a pathological state is irremediable, and that treatment for it is unadvisable, is always a matter of as great moment as the ascertaining that a more fortunate state of affairs exists. In all departments of medicine, but especially in gynecology, treatment which accomplishes no good necessarily tends to the production of evil.

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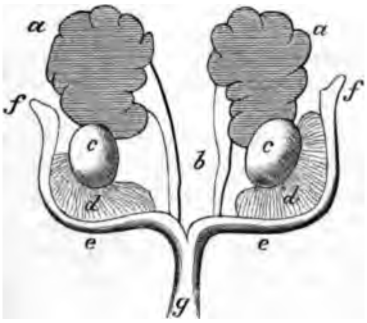
[1] See Mundé on "Electricity as a Therapeutical Agent in Gynecology," *Amer. Journ. Obstetrics*, Dec., 1885, 41 pp.; and the same, "My Recent Experiences with Electricity in Gynecology," *ibid.*, June, 1890.

Development of Generative Organs.—In the lumbar regions of the fœtus, before the end of the second month, the anatomist Wolff discovered two bodies, each consisting of a large number of tubes closed at one extremity and by the other opening into a common excretory canal. These have since been known as the Wolffian bodies, and from them essentially spring the male internal organs of generation, but not so the female. At the inner border of each Wolffian body lies a germ which, remaining unchanged until the second month, develops into the ovary of that side, while the Wolffian body gradually becomes atrophied.

From the inner sides of these descend two ducts, called the ducts of Müller, which passing downward side by side, unite at a point just below one where the urethra of the fœtus begins to show its rudimentary formation. At about the end of the second month these ducts begin to approach each other more nearly at a point in the pelvis, and, gradually coalescing and their inner walls disappearing, the vagina and cervix, and, at a later period, the corpus uteri, are created. The upper portions of the ducts, passing off to each side obliquely, constitute in the future the Fallopian tubes. Fig. 32 will show the coalescence of the Müllerian ducts in the fœtal sheep.

FIG. 32.



Coalescence of Müllerian Ducts in a Fœtal Sheep (I. Müller).

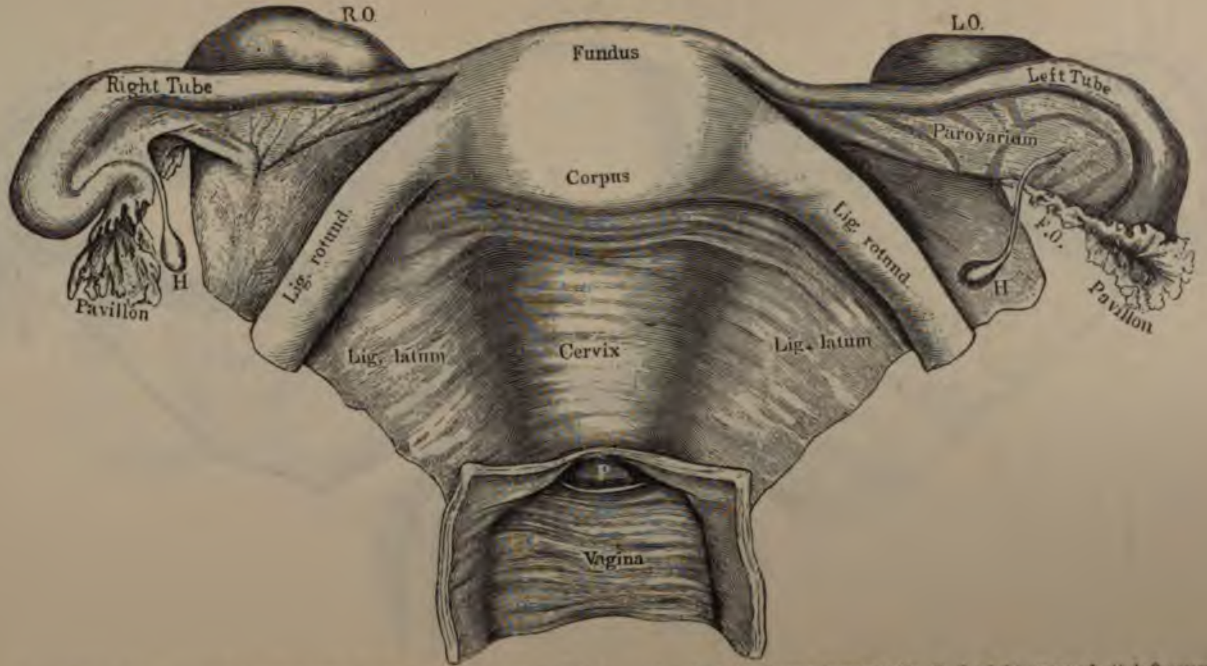
a, *a*, Wolffian bodies; *b*, ureters; *c*, *c*, ovaries; *d*, *d*, parovarium; *f*, *e*, Fallopian tubes; *g*, coalesced Müller's ducts, forming uterus and vagina.

A rudimentary vagina, Fallopian tubes, and uterus are thus formed, and gradually go on to full development during the rest of fœtal life. Any arrest of development affecting the ducts of Müller, any imperfection of them, or any failure in coalescence of the two ducts, even when fully developed, inevitably gives rise to malformation or deformity. Some of these produce grave consequences at puberty; others are so wanting in result that the functions of the woman are healthily performed in spite of them. Their very existence even may never be revealed, or be discovered only by accident toward the end of or after menstrual life.

The varieties of congenital malformation of these parts which we shall consider are the following:

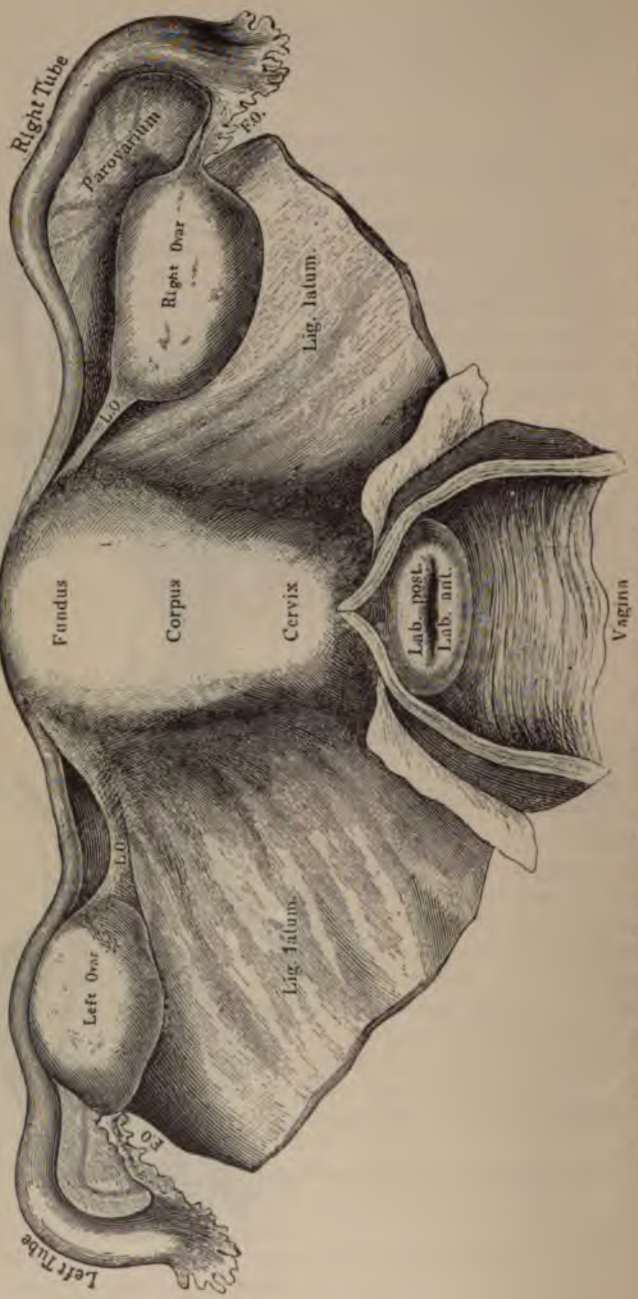
Hypertrophy of the uterus;
Absence or rudimentary state of uterus, ovaries, or vagina;
Unicorn and bicorn uterus;
Double and divided uterus and vagina;
Congenital misplacement of the uterus.

FIG. 33.



Front View of Uterus and Appendages: H, hydatid of Morgagni; F. O. ovarian fimbria; P, portio vaginalis; R. O, right ovary; L. O, left ovary. Pavillon, Infundibulum. Natural size. (From Beigel.)

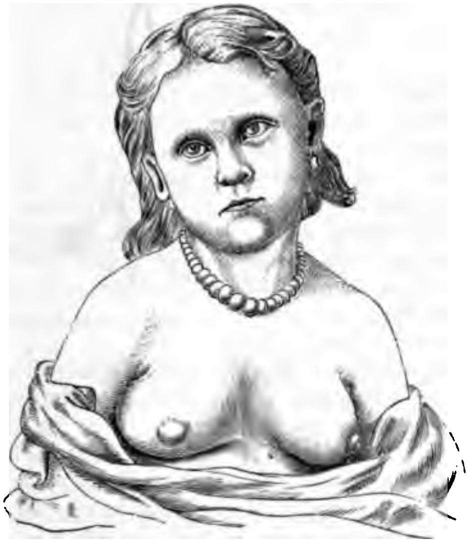
Fig. 34.



Rear View of Uterus and Ovaries: L. O, ovarian ligament; F. O, ovarian fimbria. Natural size. (From Beigel.)

Hypertrophy may affect the fœtal uterus and ovaries, and as a result the child be born with this organ and the external genitalia as fully developed as they should normally be at puberty. In these monsters by excess of development the most remarkable sexual precocity sometimes shows itself. Instances are recorded in which menstruation began at birth or within a month after, and one case of undoubted authenticity is reported in which, menstruation beginning at two years, parturition at full term occurred when the mother was only eight. Fig. 35 represents a girl whose case was brought to our notice some years ago.

FIG. 35.



A. S——, aged four years and nine months, menstruated regularly from the age of twenty-one months.

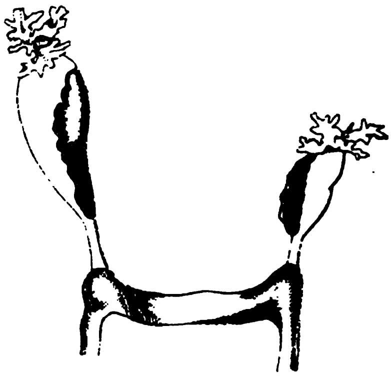
We have seen another case in which menstruation began at eight months and continued regularly.

Absence, and Rudimentary Development, of Uterus and Ovaries.—At times an entire failure, not only of coalescence, but of development, occurs in Müller's ducts. The Fallopian tubes, uterus, and vagina are all absent, and very often in such cases the ovaries likewise. In other cases the uterus is absent, while the vagina, Fallopian tubes, and ovaries are developed, coalescence of the ducts having failed while development above and below has occurred.

Entire absence of the uterus, tubes, and ovaries, as proved by post-mortem examination, not by physical exploration during life, is of so rare occurrence that some pathologists have doubted its existence. When it occurs it usually does so in infants who suffer from want of development of the lower half of the body. It must be borne in mind that sometimes rudimentary uterine horns exist, which in a physical examination cannot, even by the most practised touch, be distinguished from portions of the oviducts and ovaries. In some cases of undoubted rudimentary uterus only a slight nodular hardness can be discovered where the uterus should be, which feels like an aggregation of areolar tissue only. There can be little doubt that these cases are clinically often classed with those of absence of the uterus.

The rudimentary uterus is often accompanied by a similar condition of the ovaries, vagina, and even the mammæ and external genitalia. In such cases the vagina will often be found as a cul-de-sac measuring only one or two inches. This, however, under sexual efforts long and perseveringly continued, often undergoes great elongation and development. When this fails the urethra sometimes undergoes dilatation, and, being penetrated by the virile organ, acts as a vicarious vagina.

FIG. 36.



Bow-shaped Rudiment of Uterus (Nega).

The rudimentary uterus usually appears under one of these forms: a thin membranous expansion spreads from the extremities of the Fallopian tubes and round ligaments toward the vagina; a round, hard, two-horned solid body marks the site of the uterus; a flattened, crescentic line of tissue occupies the site of the uterus, extending across the pelvis with its convex surface looking upward; the cervix being entirely wanting, the semblance of a body is present without a cavity; the body with cornua exists, but without perforating canal; or, lastly, the cornua exist with cavities within them, while the body and cervix uteri are both very rudimentary in their development.

Since the days of modern gynecology this anomaly has been found to be of not very rare occurrence; previous to that period many cases went undetected because uninvestigated. The attention of the physician is usually drawn to their existence by the fact that the girl, arriving at sixteen or seventeen years, has never menstruated, and her relatives have become apprehensive; or marriage is anticipated, and the girl or her mother, unwilling to assume its responsibilities while mystery exists with reference to so important a subject, desires investigation; or the girl, suffering from uterine enlargement, the result of retention of menstrual blood, is accused of illegitimate pregnancy, and is brought for the physician's decision of the matter; or, worse than all, marriage has been contracted, the husband not having been candidly dealt with, sexual intercourse has been found to be impossible, and he brings his wife for examination.

In such cases the physician's duty, if he be cognizant of the facts before marriage, is too clear to require mention. So grave does the law regard a fraud of this kind that it is considered a sufficient ground for divorce. The physician may likewise be consulted, as we ourselves have been five times, as to the propriety of marriage, the man knowing perfectly the imperfections of his proposed wife, and appreciating that not only are menstruation and conception impossible, but sexual intercourse likewise. As long as the laws of physiology hold true, so long will it be the duty of the medical adviser to oppose under such circumstances the contraction of a tie which must, unless the husband be more or less than man, prove in a short time a source of sorrow and disappointment.

The evils which result from this distressing anomaly of sexual development are not merely the remote and contingent ones just mentioned; there are others which are almost inherent to it. These are absent in the most decided cases of want of development, and present in those which are less complete. Thus if uterus, ovaries, and vagina be really absent or decidedly rudimentary, the woman may pass a long life, if she does not contract marriage, not only without suffering, but without knowledge of her imperfection. If, however, a complete atresia exists in the lower portion of the uterus only or upper portion of the vagina, while the ovaries are sufficiently developed for ovulation to occur, menstrual blood collects, distends the uterine cavity, sometimes regurgitates through the tubes or ruptures them, or furnishes material for septic absorption.

Such cases sometimes terminate fatally from these causes, and not rarely from the results of surgical procedures adopted for their relief. They will be elsewhere considered in reference to this aspect of the subject.

Where the uterus is almost or entirely absent and the ovaries present, the most aggravated derangements of the nervous system—hysteria, epilepsy, and mental disorders—sometimes show themselves. [In such a case seen in consultation by Drs. Peaslee, Emmet, and myself, extirpation of the ovaries was decided upon and performed by Dr. Peaslee. Unfortunately, the result was a fatal one. In a similar anomaly mentioned by Duplay[1] a post-mortem examination gave unequivocal evidences of ovulation. Repeated small hematoceles must, of course, have been the consequence, as neither oviducts nor uterus existed.—T. G. T.]

The question of treatment in such cases turns entirely upon the propriety of the surgical resource of opening a free passage through the atresic cervix uteri or vagina for the escape of menstrual blood already imprisoned, or for that which may be in the future excited to flow by therapeutic means adopted for that purpose. Before adopting—and, as is equally important, before discarding—these, a thorough exploration should always be made, and the manifold dangers of the operation, together with its decided chances of failure, should be carefully considered. A great deal of unwarrantable surgery has been indulged in in such cases from neglect of these two duties.

Physical Examination of such Cases.—The patient should be anæsthetized, and placed upon the back upon a table and the legs flexed by two assistants. Then the sphincter ani being gently stretched, the index and middle fingers of the left hand should be carried far up the rectum, and conjoined manipulation carefully practised for detection of the uterine body. To this may be added the approximation of the posterior wall of the bladder to the fingers in the rectum by a sound in the bladder, or, if necessary, by resort to introduction of the index finger of the right hand through the urethra in cases difficult of decision. There are no other means of physical exploration at our command, but these, intelligently practised, are very reliable if preceded by anæsthesia, as they should always be.

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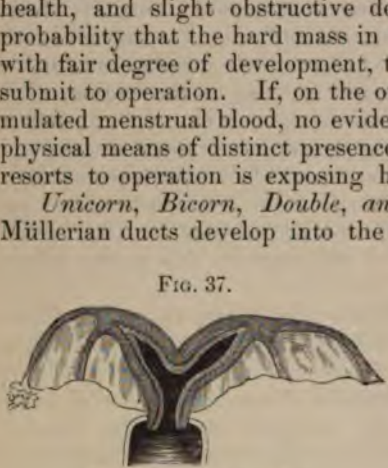
[1] Klob, *Anat. Fem. Sex. Org.*, p. 43.

But he who in these cases relies for his decision upon physical signs alone will surely be misled; rational ones are of equal importance as a guide to surgical interference. A large hard, fibrous mass may be found in the position of the uterus, and yet the grave operation for atresia vaginæ might not be advisable. If menstrual blood is discovered imprisoned, if a distinct period of excitement or discomfort marking ovulation can be traced, or if the otherwise perfect development, good health, and slight obstructive deformity which exist, all point to the probability that the hard mass in the site of the uterus is that organ with fair degree of development, the patient should be encouraged to submit to operation. If, on the other hand, there be no trace of accumulated menstrual blood, no evidences of an ovular nisus, and none by physical means of distinct presence of a mass in the uterine site, he who resorts to operation is exposing his patient to an unwarrantable risk.

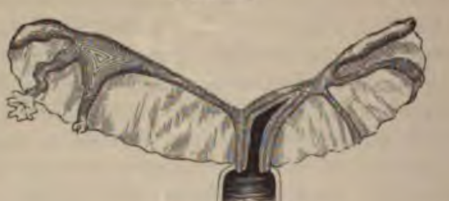
FIG. 37.



Bicorn Uterus (Schroeder).

Unicorn, Bicorn, Double, and Divided Uterus.—Sometimes the Müllerian ducts develop into the two halves of the uterus, but, coalescing badly or the walls dividing tube from tube not being obliterated by absorption, deformities of less gravity than those just mentioned may result. One horn alone may develop, while the other fails to do so; both horns may develop, but unite only at the cervix; or both horns may develop, and, although they coalesce perfectly, their internal walls may not disappear, and thus a septum remain which divides the cavity into two.

FIG. 38.



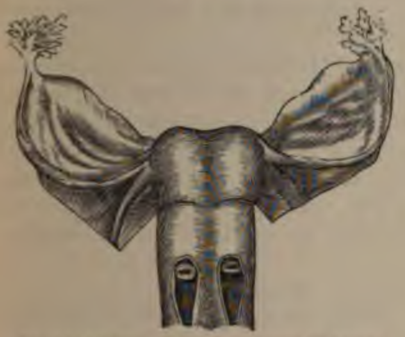
Unicorn Uterus (Schroeder).

The accompanying figures will give a very good idea of these deformities by arrest of development.

The septum between the two vaginæ may be perfect, or it may be absent at certain spots, and then the vagina there constitute but one canal. It is necessary to know this in order to understand how a vagina may be double in one part and otherwise single.

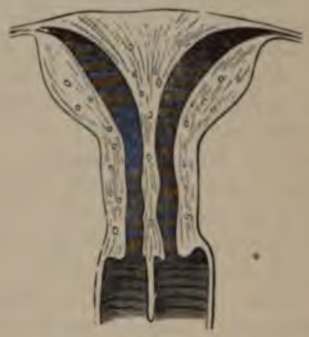
Some of these deformities create great difficulties in diagnosis and curious problems in physiology; such, for example of the former, as cases in which menstrual blood becomes imprisoned in one dilated uterine half, while the other remains empty; and of the latter, instances in which a child is born at full term from one uterine cavity, and in two or three months another from the other, or in which a white and a mulatto child, the offspring of different fathers, are produced at the same parturient act.[1]

FIG. 39.



Double Uterus. (From specimen in possession of T. G. T.)

FIG. 40.



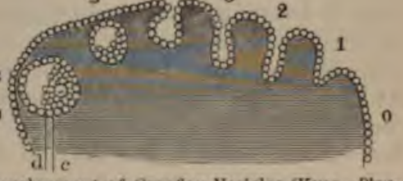
Divided Uterus (Kussmaul).

Ordinarily, these malformations produce no evil, and it is probable that only a very small proportion of them come to the knowledge of the patient or physician. They require no treatment.

Congenital Misplacement of the Uterus.—Sometimes the uterus is placed, by reason of its peculiarity of development, obliquely across the pelvis, inclining to one or other side; or, one half developing more decidedly and rapidly than the other, a congenital latero-flexion exists; or, the fundus being flattened, what is called the anvil-shaped uterus results. The chief importance of the recognition of these states is connected with prognosis and the futility of treatment for their removal.

Absence and Rudimentary State of the Ovaries.—The ovaries, as well as the uterus, may be either not developed at all or very imperfectly so. These organs arise about the end of the second month of fœtal life from a germ at the side of the Wolffian bodies. As they develop, the outer covering dips in, as shown in Fig. 41, to make the Graafian follicles, which contain the ova, the discharge of which at stated periods constitutes the great function of these glands and the characteristic fea-

FIG. 41.



Development of Graafian Vesicles (Kuss., *Physiology*).

0, 0, columnar epithelium covering cortical portion of ovary, drawn so as to show the difference between it and the flat epithelium of the peritoneum proper, which terminates in a circular line at the base of the ovary.

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[1] This last event may, however, be caused by superfecundation; that is, by fruitful coition with a white man and a negro at a short interval, so that practically two separate ova are impregnated by different men very nearly at the same time.

ture of the female sex. Sometimes these organs contain few if any follicles, and are incompetent to their duty in the economy. The results of this arrest of perfect development are amenorrhœa and sterility, which usually prove entirely rebellious to treatment.

The activity with which this reduplication and formation of follicles goes on may be judged of by Sappey's[1] statement that Kölliker counted in a fœtal ovary more than six thousand.

Absence and Rudimentary State of Vagina.—Like the uterus, the vagina is created by union of the Müllerian ducts, and like it also is subject to a variety of malformations, due to an arrest of development or failure of complete union. The chief of the anomalies thus created are diminutive, rudimentary, unilateral, and atresic vaginæ. Some of these are productive of no evil consequences and require no treatment; others will be considered under the heads of Atresia Vaginæ and Retention of Menstrual Blood.

Short Vagina.—The vagina may be congenitally so short as to afford scant room for the male organ during connection. Proportionally, the vaginal portion of the cervix is then short, and the vaginal vaults are so shallow as to materially alter the normal relations between the uterine and vaginal axes.

Anomalies of Uterine Development during Childbirth.—The uterus is an organ which varies greatly at different periods of life in size and shape. In the fœtus, the girl at puberty, the nulliparous woman, the multiparous, and the old woman who has lived beyond the menopause it is a different organ in these respects. In the first the neck is disproportionately large; in the second the body and neck gradually become equal in size; in the third the size of the body preponderates; in the fourth the cavity of the body enlarges and the os externum changes its shape; and in the fifth a general physiological atrophy occurs, which diminishes the size of the whole uterus, though affecting the body somewhat more than the neck.

It is the changes, and the anomalies which mark them, occurring between birth and the establishment of puberty which are now to receive attention. During this time the uterus very slightly develops until puberty is reached, when the rapid development of that period shows itself especially in this organ. During childhood the uterine body is bent forward, an anteflexion existing. This gradually passes off, leaving only a slight ante-curvature, to last through life, as the changes of puberty cause the uterine walls to become dense and resistant. At puberty one wall sometimes develops rapidly, while the other correspondingly undergoes atrophy. Anteflexion, or more rarely retroflexion, is the result, and the first menstrual effort is attended by pain and obstruction. Any influence which presses the abdominal viscera down upon the uterus while yet this organ is soft and yielding tends to develop this anomaly, which has received the name of congenital flexion.

Again, the fœtal uterus with its disproportionately long neck may disappear, and still the organ, now well proportioned, may not undergo development at puberty, but may remain small and unprepared for its coming functions. This constitutes the incompletely developed uterus of Kiwisch, Rokitansky, and Scanzoni, the pubescent uterus of Puesch, and the congenital atrophy of other writers.

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[1] Courty, *Mal. de l'Utérus*, p. 66.

This condition is marked by tardy occurrence of menstruation and by a feeble, irregular, and scanty discharge; a marked tendency to complete amenorrhœa existing.

Fortunately, a good deal of benefit, under these circumstances, often results from treatment calculated to attract nervous influence and nutrition to the defective organ. The most reliable of these are the cautious and systematic use of small tents, the employment of an intra-uterine galvanic stem, a current of electricity passed through uterus and ovaries, and the complete establishment of the general health by exercise and tonic treatment.

In some of these cases the most unfortunate results show themselves in connection with the nervous system. In several cases we have seen epilepsy, and in one mental imbecility, which seemed to be clearly traceable to the absence of sexual development.

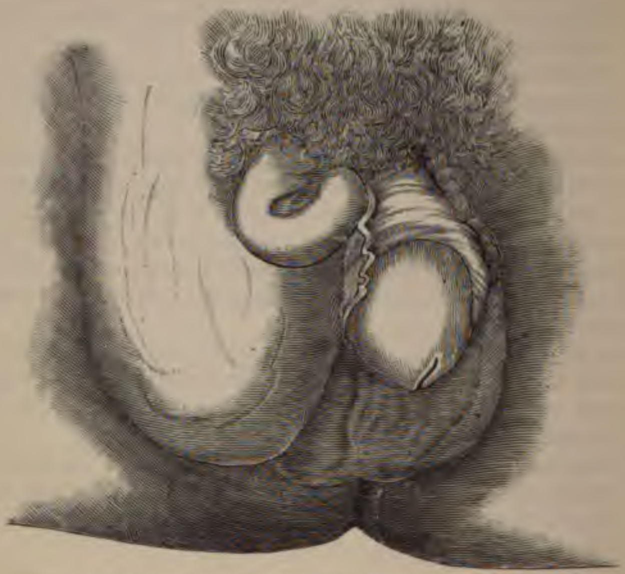
Even when no general symptoms show themselves, the undeveloped condition which characterizes these cases to a certain extent incapacitates the female for the duties of wife and mother.

Hermaphrodism.

By this term is meant a congenital malformation of the sexual organs in which the germinal gland of each sex (the testicle in the male and the ovary in the female) is found in one and the same individual, together with more or less perfect organs belonging to both sexes. Anatomically and clinically, hermaphrodism may be divided into two chief varieties—the *true* and the false or *pseudo* hermaphrodism.

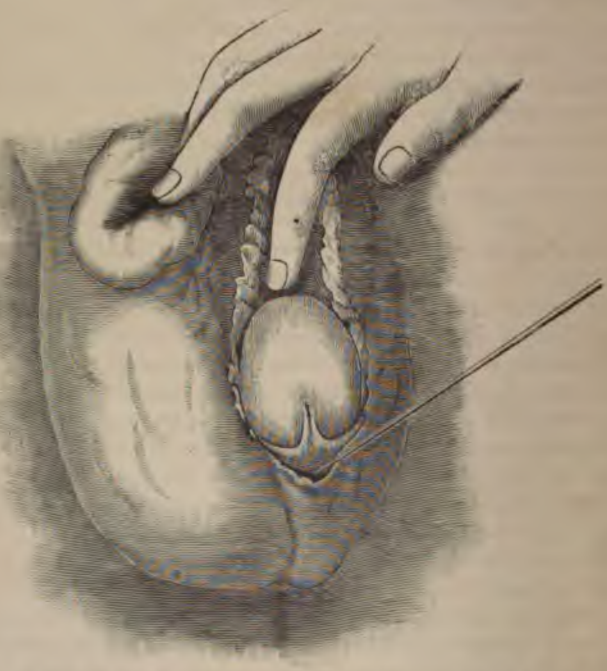
Of *true* hermaphrodism there may be three forms: first, the bilateral, in which an ovary and a testicle are found on each side; second, unilateral hermaphrodism, when an ovary or a testicle is found on one side and on the other both ovary and testicle—no well-authenticated case of this variety has been recorded; third, lateral hermaphrodism, with an ovary on one side and a testicle on the other. A number of examples of this class have been reported, the best known of which is probably that of Katharine Hohmann, in whom we had an opportunity to satisfy ourselves by repeated thorough examinations that, besides two testicular-shaped bodies in the folds of skin on either side of the vaginal pouch, there was a small rudimentary uterus to be reached by the sound through the hypospadiac urethra, and to the left a body which could be taken for nothing else than an ovary. In the year 1867, in Scanzoni's clinic at Würzburg, we had occasion to carefully observe this individual during several months, and repeatedly saw a discharge of blood oozing from her urethra at four-weekly intervals, which could properly be taken for normal menstrual blood. During the same interval we had the opportunity, too, to examine fluid ejaculated from the urethra which showed the presence of spermatozoa. At this time the person posed as a woman. In 1875 the same person called on us in New York in the garb of a man who was then fifty-one years of age, informed us that he

FIG. 42.



Front View of Genital Organs of Katharine Hohmann.

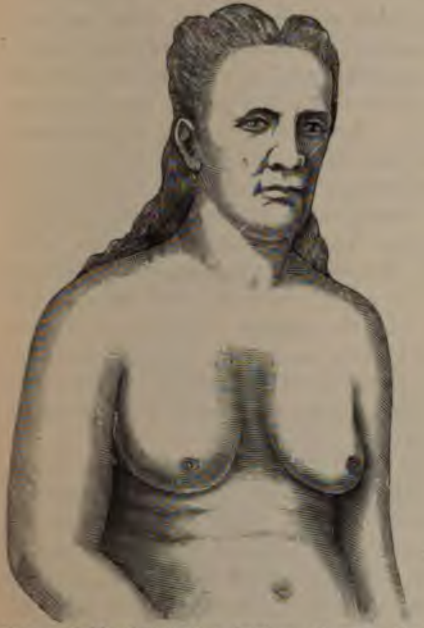
FIG. 43.



Same, more from the front, a Stylet introduced into the Opening of the Urethra.

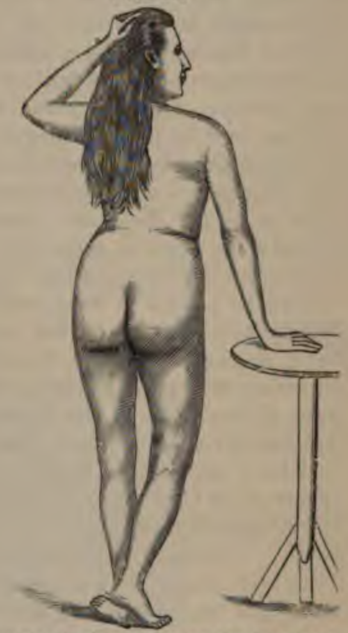
had passed the menopause successfully, and since then had assumed the functions of a man and was married to a woman. At our solicitation he allowed us to be present during the act of sexual intercourse, and we distinctly saw and smelled the semen on the genital organs of his wife.

FIG. 44.



Upper Half of Anterior Surface, showing the breasts (Katharine Hohmann).

FIG. 45.



Posterior Surface, showing the long hair, the slender back, the broad hips, and the finer build of the left side (Katharine Hohmann).

Unfortunately, a post-mortem has never been held upon this person, supposing him to be now dead, by which the examinations during life could be verified.[1]

According to this case, an individual possessing the attributes of the true hermaphrodite might be expected to be able to fulfil the sexual functions of either sex at will.

False Hermaphrodism.—By far the majority of cases of so-called hermaphrodism which come to the notice of the practitioner are those in which the individual is really of one sex, some of the peculiarities of the genital organs of the other sex being present in a sufficient degree to mislead a careless observer. There are two great varieties of this malformation:

First, *Androgyne*, in which a man simulates a woman both in the general conformation and in the local appearance of his sexual organs. The face is usually more or less beardless; the hair is likely to grow long; the breasts are well developed, with prominent nipples and areolæ; the hips are perhaps a little broader than in normal man, still not so wide as in a well-formed woman. The thighs are round and more muscular than in woman, the voice is rough, and the larynx prominent. In the sexual organs the mons veneris is covered with the usual amount of hair; the penis is about half the size and length of that of a normal man; the urethra ends, not at the tip of the glans, but either halfway down the lower surface of the organ or at its very root (hypospadias); the scrotum is cleft into two fleshy folds simulating the labia majora, each of which contains a testicular-shaped body with epididymis, or one of the testicles may be still in the inguinal canal or even in the abdominal cavity. Between these labia there is a blind pouch varying from half an inch to three inches in depth. A bimanual rectal examination of course reveals the absence of the internal sexual organs of a female. The diagnosis is easily made by a correct appreciation of the above signs. This is by far the most common variety of spurious hermaphrodism. Usually the penis is capable of erection, and ejaculation of semen takes place from the hypospadiac urethra; therefore impregnation of a female could take place if it were possible so to approximate the male and female organs as to introduce the semen into the vagina. Such individuals have, on the other hand, been looked upon as women, married as such, and their true sex has never been discovered until inquiry was made of some physician as to the reason of their not conceiving or the post-mortem has revealed the true state of affairs.

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[1] See Mundé: "A Case of True Lateral Hermaphrodism," *Amer. Journ. of Obstetrics*, 1875.

There are several cases on record, one of which we think we have observed,[1] where the external genital organs were those of a perfectly formed female, but where the vagina was a blind pouch of nearly normal depth. Uterus and ovaries were absent, but in each labium was to be felt a body shaped like a testicle, with an apparent epididymis. Menstruation, and molimina had never been present. In a similar case of Leopold the post-mortem verified the fact that the labial bodies were testicles.[2]

[It is due Dr. Thomas to state that he differed from me in his view of this case, believing the labial bodies to be prolapsed ovaries.—P. F. M.]

Second, *Gynandria*, the far-less frequent condition in which a woman simulates a man, the resemblance being confined almost entirely to the external sexual organs. The clitoris is elongated two to three inches and possessed of more or less erectility. (See Fig. 48.) Of course only a very superficial examination would mislead an expert into taking such a woman for a man.

The treatment of hermaphrodism is practically *nil*. A hypospadiac urethra may possibly be restored to its normal condition by a plastic operation, or a blind vaginal pouch closed, but usually nothing can be done to restore the parts to their normal state. A hypertrophied clitoris should, of course, be removed.

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[1] See case of Mundé, article by Swasey, *Amer. Journ. Obst.*, vol. xiv., 1881.
[2] Swasey, *loc. cit.*

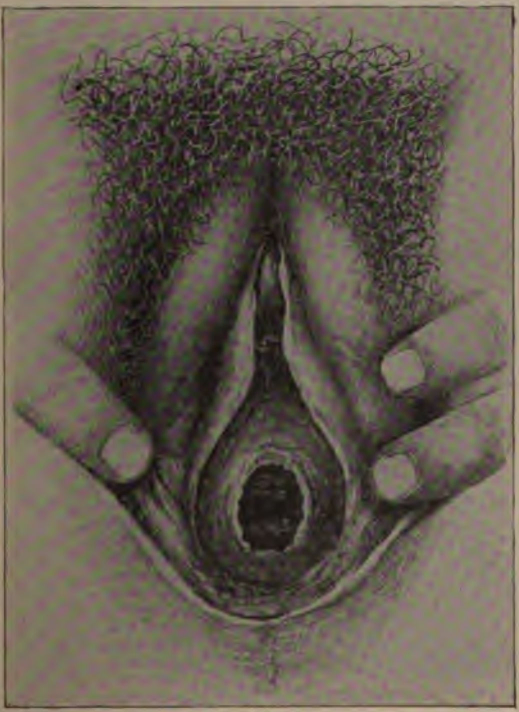
CHAPTER VIII.

DISEASES OF THE VULVA.

NORMAL AND APPLIED ANATOMY.—The vulva is the name given to the external genitals, comprising the mons veneris, labia majora and minora, clitoris, meatus urinarius, vestibule, fossa navicularis, fourchette, and hymen.

Labia Majora.—From the mons veneris, which consists of adipose tissue covered by skin in which exist numerous hair-bulbs, two folds of integument pass downward to unite at the fourchette. These are called the labia majora. Externally they are covered by skin which contains scattered hair-bulbs, but on their inner surfaces their covering is mucous membrane, which is studded with sebaceous folli-

FIG. 46.



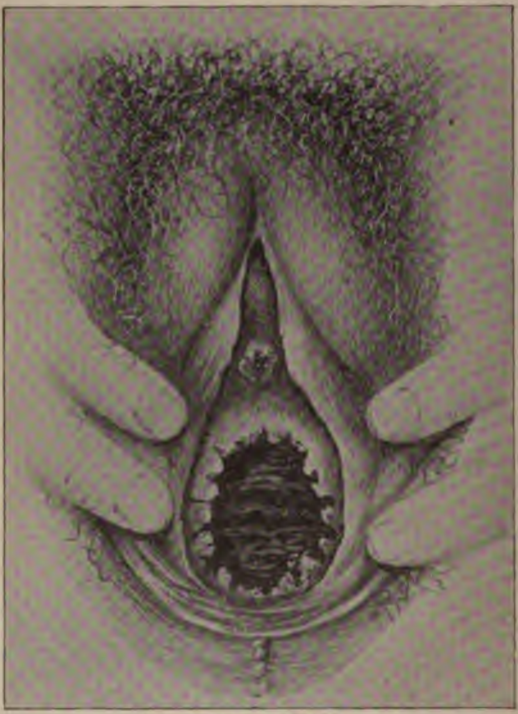
Vulva of Virgin.

cles, the secretion of which is unctuous and semisolid. These glands are remarkably large, reaching, according to E. Klein,[1] a diameter of 0.5 millimetre. They open immediately upon the free surface.

Within, the labia are filled with adipose tissue, a portion of which is enclosed in sacs, of which one arises from each external abdominal ring and extends downward toward the fourchette. To these Broca has given the name of dartoid sacs. The peculiar anatomical conformation of the labia majora is intended to allow their expansion during expulsion of the fœtus at term. After labor the distended and flabby labia rapidly contract to the condition previous to pregnancy.

The Clitoris.—Beneath the superior commissure of the labia juts forward a little erectile organ, which is analogous to the penis of the male and receives the name of clitoris. It is covered by mucous membrane, consists of erectile tissue, and arises by two rami, one of which is attached to each ramus of the pubes. Like the penis, this little organ is provided with a prepuce and frænum. The object of the clitoris is to furnish to the female the nervous erethism which is necessary to a perfect performance and completion of the sexual act. In fact, it may be said to be the organ of voluptuousness in the female, by

FIG. 47.



Vulva of Married Nullipara.

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[1] Stricker's *Manual of Histology*.

the excitement of which, outside of the sexual act, an orgasm and ejaculation of mucus from the Bartholinian glands is produced.

Labia Minora.—These consist of two folds which, arising at the clitoris, pass downward and disappear about halfway between the two commissures. Like the clitoris, they are formed of erectile tissue covered over by mucous membrane, and an attentive examination discovers upon their surfaces a large number of glands which secrete a sebaceous material. These organs also take part in furnishing sufficient tissue for distension during parturition. In certain races, notably the Hottentot and other African negroes, the nymphæ normally attain a length never met with except as a disease in Caucasian races, sometimes extending downward nearly to the knees, and being looked upon as signs of distinction by their possessors.

The Fossa Navicularis and Vestibule are merely spaces intervening—the first, between the perineum and vagina; the second, between the meatus and clitoris. They are both covered by mucous membrane, and the latter is studded with follicles.

The fossa navicularis becomes distinct only on separating the labia, whereby the posterior commissure is put on the stretch; a boat-shaped furrow is thus formed between the hymen and the fold of skin called the posterior commissure. The vestibule, on the other hand, is unchanged in shape or appearance whether the labia are separated or not, being situated between the two unyielding branches of the pubic bones. The posterior commissure is usually torn during the first confinement, such a tear being considered almost physiological and requiring no treatment.

The Hymen is a thin veil consisting of a double fold of mucous membrane, which in part closes the ostium vaginæ. When ruptured its remains can be distinctly discovered, sometimes not at all diminished in bulk, at the orifice of the vagina.

These remains are called the carunculæ myrtiformes, from a fancied resemblance to the buds of the myrtle as seen by the old anatomists. The hymen is usually ruptured by the first sexual intercourse, but its remains are visible in the shape of the caruncles just mentioned. When these caruncles are entirely absent or exist only on the anterior segment of the vaginal orifice, as is most frequently the case, they have either been destroyed by the distension and inevitable superficial sloughing following parturition at term, or by the passage of some large body, such as a fibroid tumor, over the perineum, or the hymen is congenitally absent. The knowledge of the different conditions of the hymen and its remains is of importance from a medico-legal standpoint, since often the physician is called upon to decide whether a woman is a virgin, has had connection, or has borne children, and only a physical examination can decide the question correctly,

Passing over the clitoris, to which it is attached, and running downward on each side of the vulva, so as in part to cover the bulbi vestibuli, will be found a muscle which is, we think, very generally regarded as the sphincter vaginæ. Savage[1] denies that it, the bulbo-cavernous muscle, has any such influence, the true sphincter vaginæ being the pubo-coccygeus muscle, which is seen, by dissection within the pelvis, arising from the inner surface of the pubic bones. Descending on the sides of the vagina, some of its fibres pass between it and the rectum to meet others from the opposite side in the perineum. Another set go behind the rectum, and, uniting with similar ones from the opposite side, intermix with its circular fibres to make the internal sphincter. The remaining fibres, still more outward, are inserted in the sides of the coccyx.

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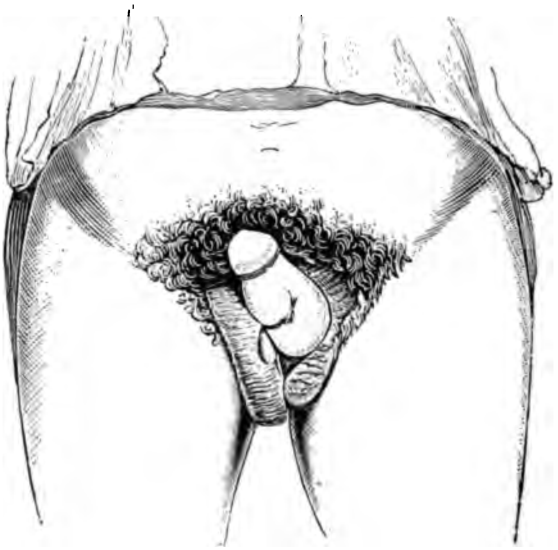
[1] *Female Pelvic Organs*, 3d ed.

Deformities of the Vulva.

Hypertrophy of the labia majora and of the nymphæ is not of uncommon occurrence. It may be caused either by syphilitic infection, elephantiasis, inflammatory hyperplasia, or by the irritation set up by the practice of masturbation.

Hypertrophy of the clitoris may occur in consequence of the same causes, and is more apt to be found in prostitutes. All three of these diseases are more common in tropical climates, owing to the irritation produced by the decomposition of the natural secretion of the parts by the heat. Enlargement of the clitoris is by no means as frequent in our experience as in that of other writers whose opportunities for examining women subject to the peculiar causes of this disease have been greater than ours.

FIG. 48.



Hypertrophy of Clitoris (Tait).

The treatment consists in the removal by the knife of any of these organs which may by its size cause inconvenience to its possessor. Hemorrhage, which may be severe, should be controlled by passing deep pins underneath the mass to be removed, tying an elastic ligature around the mass under the pins, and then, after removing the mass, inserting deep sutures, which can be readily tied as the pins are withdrawn, and thus all bleeding be avoided; or the galvano-cautery loop or the Paquelin cautery may be employed. Removal of the clitoris, unless decidedly enlarged, is very seldom required. The excision of the normal organ for the cure of masturbation, nymphomania, or general neurosis, which many years ago was introduced by Baker Brown of London, has long since fallen into disuse. We have never performed it. Unless the nymphæ are very much enlarged, so as to incommode the patient or interfere with coition, they should not be removed.

Atrophy of the Labia, Nymphæ, and Clitoris.—Occasionally all these organs may be congenitally absent or so imperfectly developed as to be scarcely perceptible. After the menopause, as old age approaches, the physiological senile atrophy of these organs takes place, which change occurs equally in the internal sexual organs. No treatment is required, or indeed would be effectual, for this atrophy.

Neoplasms of the Vulva.

Besides the deformities of the vulva described in the previous section, this part is subject to the formation of a variety of tumors, the chief of which are condylomata, acuminated and flat, papillomata, fibromata, cysts, myxomata, lipomata, elephantiasis, lupus, sarcoma, cancer, osteomata, enchondromata, neuromata, and hydrocele.

The condylomata acuminata or papillomata may be due to gonorrhœal irritation, or simply to the hyperæmia and discharge from the parts occurring during a vulvo-vaginitis or a normal pregnancy. They are found chiefly on the labia minora at the posterior commissure, and may extend more or less deeply into the vagina. The condylomata lata occur usually on the inside of the labia majora or on the perineum and around the anus. They are always due to true syphilitic infection.

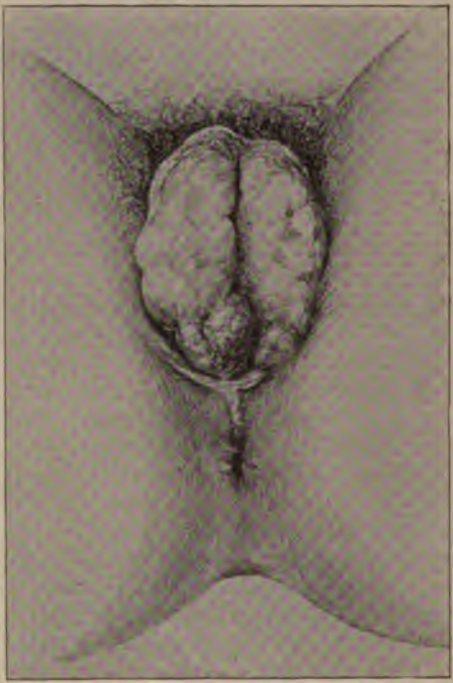
The treatment of the acuminate or papillomatous growths (so-called venereal warts) consists chiefly in removing them with scissors and touching the wounds with the stick of nitrate of silver or strong nitric acid. Compresses soaked in the tincture of *Thuja occidentalis*, mixed with equal parts of water, are said by Piffard to cause atrophy of these growths. The broad condylomata are of course treated on the antisyphilitic plan.

Fibromata of the vulva are of uncommon occurrence, and are usually found in the labia majora, as is also the case with cysts, myxomata, and lipomata. The differential diagnosis of these various growths is made on general principles, care being taken always by percussion to eliminate the possibility of a labial hernia being mistaken for one of these tumors. None of these growths, as a rule, attains a very large size, except the lipoma, which has been observed reaching almost down to the knees, in one case weighing ten pounds. The cysts seldom grow larger than a hen's egg; the fibromata have been found the size of a child's head.

The treatment, of course, consists in removing them—that is, dissecting them out with the knife—and closing the wound by deep sutures.

Elephantiasis of the vulva usually affects the clitoris, the labia majora, and nymphæ all together, and may grow to such size as to completely close the vaginal orifice and interfere with coition. (In one case, a colored woman four months pregnant, whom I saw several years ago, I was obliged to remove the mass, which involved all the organs mentioned, because its increase of growth during pregnancy would have inevitably prevented the delivery of the child. The woman recovered without difficulty and carried her child to term.—P. F. M.)

FIG. 49.



Elephantiasis of Vulva (Mundé).

Lupus, sarcoma, and cancer are fortunately rare. They occur usually upon the labia minora or majora, spreading thence in various directions; and we have seen the whole mons veneris a raw bleeding sore from epithelioma and lupus respectively.

The prognosis of cancer, which is usually of the epitheliomatous variety, is, of course unfavorable unless seen sufficiently early to allow of complete extirpation. Lupus is more readily cured. Sarcoma presents itself as a tumor springing from either the labia majora, minora, or clitoris, and is diagnosed mainly by its rapid growth and soft feel. After removal of course the microscope settles the diagnosis. If it can be completely removed, the prognosis is favorable, otherwise it is liable to return very soon.

Osteoma and enchondroma of the vulva are reported by some of the older observers, but no recent writer mentions any well-authenticated case of these (in this region certainly unexpected) neoplasms.

Neuromata of the vulva, however, are of more frequent occurrence, and are either situated about the meatus urinarius or clitoris or at the posterior commissure, where they spring from the torn remnants of the hymen. These neuromata are usually nodules not larger than a pea or bean and exquisitely sensitive to the touch, causing pain not only during walking and other accidental friction, but also during coition. They should be removed by thorough deep excision with scissors.

Hydrocele will be referred to in a separate section later on in this chapter.

Vulvitis.

Definition.—Vulvitis is the name applied to inflammation of the skin and mucous membrane covering the vulva. Affecting all of these structures, the surface covered by epithelium and the glands imbedded in it, the inflammatory action sometimes extends through the submucous tissue into the proper structure of the parts underlying it, creating tumefaction, pain, and sometimes even suppuration.

Varieties.—Authorities differ with regard to the classification of its varieties.

That which appears most appropriate is the following:

Simple vulvitis;
Purulent vulvitis;
Follicular vulvitis.

There is a variety of the affection also which is styled gangrenous, but it is so entirely confined to children that its consideration here would be out of place.

Simple Vulvitis

is by far the most common form of inflammation of the vulva. It is usually produced by the irritation of an acrid and irritating vaginal discharge, by the presence of pediculi pubis or of pruritus; the irritation induced by the original cause being aggravated very greatly by the rubbing and scratching of the patient in her efforts to allay the burning and itching. The secretions from the inflamed surfaces are usually of a serous, non-purulent character; they are not infectious, except where possibly a gonorrhœal virus may have caused the disease. The diagnosis is made by the red, eroded appearance of the vulva, which appearance often extends down to the anus and to both nates, especially in fat women. In blondes the secretion of the vagina and vulva decomposes more readily than in brunettes, hence the mucous membrane and skin are more acutely inflamed and eroded in the former.

The treatment consists in removing the original causes—namely, the irritating vaginal discharge—or in destroying the lice, with ungt. hydrargyri or ungt. sabadillæ or, if examination of the urine shows the presence of sugar, endeavoring to cure this source of irritation by proper dietetic regimen. Locally, the application of a solution of nitrate of silver of twenty grains to the ounce every other day, with frequent lotions of the lead-and-opium wash diluted one to eight, or used in the same strength on cloths worn over the vulva, will very soon produce great improvement, and, if persevered in, a cure. Also daily tepid sitz-baths will be found to afford much relief from the itching. This form of vulvitis may, if of a severe type or allowed to run on unchecked, merge gradually into the next variety, or purulent vulvitis.

Purulent Vulvitis.

This variety of the affection may be either of non-specific form or a true gonorrhœa of the vulva. The former is in many respects analogous to balanitis in the male, while the latter resembles very closely specific inflammation in other mucous membranes of the body.

Causes.—It may result from

Simple vulvitis;
Vaginitis, specific or simple;
Want of cleanliness;
Injury, or friction from exercise;
Eruptive disorders;
Onanism;
Chemical irritants;
Excessive venery.

Symptoms.—The parts are red, swollen, hot, and at first dry. Then a free flow of pus takes place which bathes the whole surface and stains the linen of a yellow hue. In addition to these signs of active inflammation, superficial ulcers will be found scattered over the parts affected, and in rare cases patches of diphtheritic membrane will be seen adhering to them. At times the meatus urinarius becomes affected, and painful micturition, with scalding and heat, is complained of. At others the most intense pruritus affects the vulva, and the patient in endeavoring to obtain relief may contract the habit of masturbation. Should the inflammation extend to the vagina, the symptoms of vaginitis will also show themselves, and by a similar extension to the bladder those of cystitis may develop. In severe cases febrile action, with thirst, heat of skin, and general discomfort, is present, but this is not usually the case.

The pus which is discharged, always in the specific form of the disease and very generally in the non-specific, gives forth a disagreeable odor, and is usually so irritating in its nature as to excoriate the inner surfaces of the thighs when it comes in contact with them. Should this material, even in the non-specific form of the affection, be carelessly brought in contact with the conjunctiva, a severe form of purulent ophthalmia is excited. No doubt an acute urethritis may be induced in the male by contact with this discharge, although no suspicion whatever of a venereal affection exists in either party. This urethritis will be much more amenable to treatment than gonorrhœa, or may even cure itself. The secretions of both male and female are found to be free from the germ now universally considered pathognomonic of gonorrhœa—namely, the gonococcus.

Course and Termination.—Even without treatment it is probable that the affection would always be recovered from in time; but it would run a lengthy and tedious course, and perhaps give rise to complications which would be productive of greater evil than the original disorder. When properly treated it generally runs a rapid course and is readily cured.

Treatment.—If inflammatory action be excessive, the patient should be kept in bed upon low diet, and the bowels freely acted upon by saline cathartics. Emollient applications should be made constantly to the inflamed part, and cleanliness scrupulously observed. The patient should be directed to bathe the vulva freely with warm water three or four times daily, and to apply a warm poultice of powdered linseed, slippery elm, or grated potato. To the poultices may be added with advantage a solution of acetate of lead and tincture or powder of opium.

As soon as the acute action has subsided, the lead-and-opium wash already referred to should be kept in contact with the parts by dossils of lint soaked in it and placed between the labia. It is thus compounded:

℞. Tr. opii, ℥ij;
Plumbi acetat., ʒj;
Aquæ, Oj.—M.

At a still later period the diseased surface should be painted over several times a day with a solution of persulphate of iron and glycerin, 1 part of the former to 8 of the latter. Should the disorder not be entirely eradicated by this treatment, the vulva may be painted over once in every forty-eight hours with a solution of nitrate of silver, 10 grains to the ounce of water, and kept constantly powdered with lycopodium, bismuth, or starch until recovery is complete. Should pruritus attend the latter stages of the disorder, a wash composed of 1 scruple of carbolic acid to 1 pint of water will be found useful.

In many obstinate cases the painting of the vulva with a solution of 1 : 2000 of corrosive sublimate, followed by the application of a 10 per cent. ointment of cocaine, with lanolin, will give great relief and hasten the cure. The application of solution of nitrate of silver, followed by the lead-and-opium wash, has on the whole given us the best results.

Adhesive Vulvitis.

By this term we mean to imply the adhesion and eventual firm union between the nymphæ, and even the labia majora, in cases of acute or subacute vulvitis where the disease has caused the adjacent surfaces to become eroded. This accident is not so likely to occur in married women, for obvious reasons, as in women whose genital organs are not subject to frequent physical disturbance. In young children, virgins, and in women whose organs are undergoing senile atrophy, however, we have seen the adjacent surfaces of the labia so firmly united as to require division by the knife. Recently a child of two years was brought to us by her physician, because the mother had noticed that below the meatus urinarius the vaginal orifice seemed closed. On sharply pulling apart the labia with the fingers, they parted, revealing the normal entrance of the vagina. The raw surfaces of the labia were painted with a mild solution of nitrate of silver and ordered to be kept apart by pledgets of lint until healed. In a nulliparous married woman who recently came under our care for painful coition we found the cause of this complaint to be a firm union of the nymphæ down to the level of the meatus urinarius. The insertion of the penis of course stretched this apron of skin transversely and gave rise to severe pain. There was no history of vulvitis, but undoubtedly this must have been present, as the pain was of comparatively recent date. We excised a wedge-shaped strip from the median line of the adherent surfaces as far up as the clitoris, and sewed the lateral edges of the wounds together, and then kept the vaginal orifice open by the daily use of dilators, with the result of a perfect cure (P. F. M.).

Follicular Vulvitis.

Definition and Synonyms.—It has been already stated that in the mucous membrane lining the vulva, more especially in that covering the labia majora, labia minora, and vestibule, numerous follicles exist. Presenting themselves as solitary glands, they are classified under the three following heads: muciparous, sebaceous, and piliferous. In ordinary purulent vulvitis these, as component parts of the diseased membrane, are implicated in the morbid action. Sometimes, however, they alone are affected by disease, when the name of follicular vulvitis or vulvar folliculitis has been applied to the condition. Any or all of the varieties of glands just mentioned may be diseased, and authors have given special names to the varieties, so that a list which would comprise them all would be a long one. As examples may be mentioned papillary, pruriginous, erythematous, sebaceous, granular vulvitis, etc.

We may avoid tediousness of detail, and at the same time run no risk of being led into error, by classing all forms of inflammation affecting the solitary glands of the vulva under the head of follicular vulvitis; provided that we bear in mind that all the varieties of glands may be simultaneously affected, or that one set alone may be diseased, the others remaining healthy.

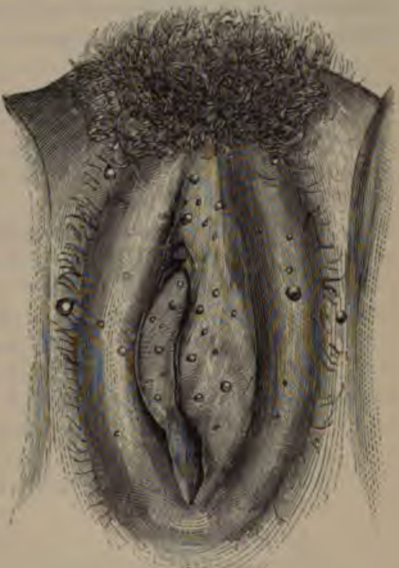
Causes.—This form of vulvitis may be induced by the following influences:

Pregnancy;
Neglect of cleanliness;
Vaginitis;
Exanthemata;
Eruptions on the vulva.

Symptoms.—There are burning, itching, and heat in the vulva, with increase of glandular secretion. At times the secretion is excessively offensive and irritating in character. The urethra frequently becomes inflamed at its vulvar extremity, and scalding in the passage of urine results. The vulva may become so sensitive to touch that efforts at sexual intercourse excite vaginismus, which thus constitutes a symptom of the disease.

Physical Signs.—If the muciparous follicles be chiefly affected, the mucous membrane of the vulva will be found intensely red in spots or patches which are slightly elevated. These are most commonly found on the edges of the lower vaginal rugæ, the nymphæ, and the carunculæ. They sometimes resemble the swollen villi upon the tongue, and bleed upon slight irritation.

FIG. 50.



Follicular Vulvitis.

Should the disease have affected chiefly the sebaceous and piliferous glands, little, red, rounded papillæ will be found on the surfaces of the labia majora and minora and the base of the prepuce of the clitoris. After a while a drop of pus will appear in the apex of each, which is soon discharged and the distended follicle shrivels. Beneath the labia minora a semifluid mass of offensive secretion will generally be found, which will, if not carefully removed, conceal the follicles underlying it.

Course and Duration.—If this disorder occur during pregnancy, it may disappear at its conclusion. In some cases it becomes so severe and produces such annoying symptoms that abortion is induced by it. If it exist in the non-pregnant state and be not appropriately treated, it may continue for an unlimited time and establish urethritis, not only in the patient, but in her husband. This fact should be especially recollected, for a suspicion of want of chastity may be excited in the mind of the husband, and serious domestic difficulty result.

Treatment.—Follicular vulvitis should be treated upon the same principles as the purulent form—by repeated ablution, warm poultices, sedative washes, and local alteratives, especially the persulphate of iron and nitrate of silver. In case these remedies do not give relief in the course of a few days, the inflamed and enlarged follicles, especially if they contain pus, must be punctured with a sharp, slender knife, and their bases thoroughly incised, so as to destroy the follicle. The contents then having been gently squeezed out, flaxseed poultices should be applied until all inflammatory action has subsided, and then the wounds healed by the ordinary wet, 2 per cent. carbolized dressing now in vogue in our surgical wards. It is rare that a case of this disease resists treatment of this kind for any definite period. A few very exceptional instances are on record where the diseased skin had to be dissected off in order to effect a cure, the sound edges of the wound being at once united by sutures.

Eruptive Diseases of the Vulva.

The skin and mucous membrane making up the vulva may, like the same structures in other parts of the body, be affected by eruptive disorders of various kinds. It is not our intention to enter with any minuteness into the consideration of these diseases, for which we refer the reader to any of the modern works upon dermatology, but merely to note the fact that they may occur upon this part, and mention the leading characteristics of the most frequent of them.

Any eruptive disorder which may elsewhere affect the skin or mucous membrane of the body may show itself on the vulva. The following list includes those which are most commonly met with and most frequently call for diagnosis and treatment:

Prurigo and lichen;
Eczema; kraurosis vulvæ (Breisky);
Acne;
Elephantiasis;
Erythema and erysipelas;
Syphilides.

As is the case elsewhere with prurigo, that of the vulva presents large, scattered papules, very irritating, and generally having their apices bereft of cuticle. Lichen shows more numerous papules, which rest upon a thickened and somewhat indurated cutaneous base. Pruritus vulvæ is the most prominent symptom of these maladies. So intense is the irritation of the vulva established by them that vulvitis is the consequence, the disease then being styled pruriginous vulvitis.

In eczema the surface is red, heated, and covered by little vesicles, which, breaking, give forth a serous fluid. The eruption confines itself chiefly to the cutaneous surface, the mucous lining being less affected. It may pass off rapidly as an acute disorder, but sometimes there are successive crops of vesicles which exhaust the strength of the patient in consequence of the nervous excitement and irritability which the disease induces. In many cases of diabetes and vesico-vaginal fistula this affection constitutes an exceedingly annoying and even painful complication.

The late Prof. Breisky of Vienna described a few years ago a peculiar disease of the vulva to which he gave the name of kraurosis (*χραῦρος*, "shrunken," "dry"), the peculiarity of which was that the skin of the labia and mucous membrane of the labia majora and nymphæ and of the vestibule, as well of the outer surface of the hymen, became glistening white, tense, and contracted. The chief symptoms complained of by the patient were severe paroxysms of pain at irregular intervals in the affected parts. No specific history, and usually not even the history of chronic eczema, could be obtained from the patients. The disease affected both virgins and married women. (We ourselves have seen such a case in a virgin of thirty-six who was referred to us by Prof. Breisky himself. All the ordinary treatment was ineffectual, and we consulted Dr. Charles Heitzmann, who pronounced it to be a case of chronic eczema, and recommended the use of the sharp curette and the painting of the surface with a saturated solution of salicylic acid in alcohol, by which the patient was, after a long and tedious process, entirely cured, the latter part of the treatment being under the direction of Dr. Heitzmann.—P. F. M.)

Acne consists in engorgement of the sebaceous follicles studding the labial faces—not in active inflammation, which would bring the case under the head of follicular vulvitis, but in engorgement by their own retained secretion.

Elephantiasis of the labia differs in nothing from that of other parts. The affection is very rare. Kiwisch records one case in which both labia increased in size, so as to equal the head of a man and to fall nearly to the knees. The parts affected by it are the labia majora and minora, the clitoris, and the perineum.

Erythema and erysipelas are simply accompanied by graver symptoms when they affect the genital organs than when they develop on the skin elsewhere.

Syphilis in secondary and tertiary form may affect the labia, creating hypertrophy, ulceration, and all the evils which it excites in other parts.

These disorders create the ordinary symptoms of vulvitis, and hence they are commonly confounded with it. Pruritus vulvæ is one of their most constant signs, and the itching which it produces often first attracts attention to their presence.

Treatment.—Little need be said here of treatment, for it should be guided by the rules which govern the management of the same cutaneous disorders in other parts of the body. The general health should be carefully attended to; change of air advised; and tonics and alteratives, such as iron and arsenic, prescribed in combination—the first with colombo, or the second with the tinctures of cinchona or gentian. Local treatment should consist in the maintenance of strict cleanliness by bathing the diseased parts freely in tepid water, and the pruritus, which invariably exists and leads to scratching, should be relieved by lotions containing acetate of lead, opium, borax, or a small amount of creasote or carbolic acid.

For eczema, keeping the affected parts constantly covered with strips of English lint spread with diachylon plaster, according to the method of Hebra, thoroughly scrubbing them before each application with green soap, has in our hands afforded us the most benefit.

Phlegmonous Inflammation of the Labia Majora.

The areolar and adipose tissues which in great degree make up the bulk of the labia majora are very frequently the seat of inflammation and abscess. The disease is excited by irritating vaginal secretions, vulvitis, direct injury, and the peculiar blood-state which results in the development of furuncles and carbuncles.

Symptoms.—In the first stage there is active congestion, which in the second produces hardness and tension from effusion of liquor sanguinis into the areolar tissue. The third stage consists in the breaking down of this mass by the process of suppuration and formation of an abscess. The pus which is thus created is usually very offensive from propinquity to the rectum and vulva.

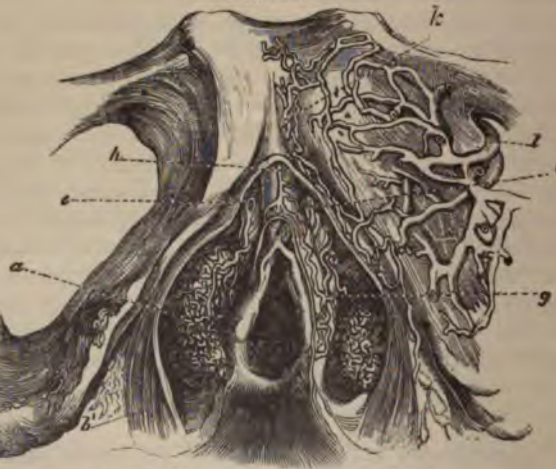
The *Diagnosis* is generally very easy. Attention is directed to the part by heat, pain, throbbing, difficulty of locomotion, and exquisite sensitiveness upon pressure. Upon physical exploration one labium is found very much swollen and quite hard and tender. Although it is usually easy to distinguish this disease, care must always be taken to differentiate it from labial hernia, displacement of an ovary, pudendal hematocele, œdema labiorum, and vulvitis. As this point will engage our attention elsewhere, it requires no further mention here.

Treatment.—The treatment should consist, in the first stage, in the application of cold and sedative lotions, low diet, saline cathartics, and perfect rest. One of the best local applications will be found to be the lead-and-opium wash. As the second stage advances the process of suppuration, which is now inevitable, should be encouraged by poultices, and as soon as pus is distinctly discoverable it should be evacuated by puncture. Early opening is advisable, because the tissues obstinately resist natural evacuation, and the accumulation may pass upward toward the abdominal ring through the dartoid sac.

Rupture of the Bulbs of the Vestibule.

Anatomy.—If an incision be made by a scalpel through the skin and its subjacent adipose tissue around the vulva, and all the tissues making up that part be dissected off, a reticulated plexus of large veins

FIG. 51.



Plexus of Veins of the Vestibule (Kobelt).

will be found beneath the labia, called the pars intermedia and bulbi vestibuli. These extensive channels for blood have been represented by Kobelt, as shown in Fig. 51.

Any influence which causes a rupture of these vessels must produce one of two effects: if there be a corresponding rupture of the skin, a free hemorrhage will occur, known as pudendal hemorrhage; if not, the blood pouring out into the areolar tissue surrounding the wounded plexus will soon form a coagulum, constituting a bloody tumor, which has received the name of thrombus or pudendal hematocele.

Pudendal Hemorrhage.

Especial attention was called to this condition by Sir James Simpson,[1] who in 1850 recorded from his own experience and that of others a number of instances in which from a very slight rupture of one labium fatal hemorrhage took place. He declared that criminal cases had repeatedly occurred in Scotland in which women, both pregnant and non-pregnant, had suddenly died from pudendal hemorrhage arising from rupture of the bulbs of the vestibule. Suspicion of injury at the hands of the husbands or neighbors had been entertained in most or all of the instances referred to.

The accident is a rare one. But two instances have come under our notice—one occurring in consequence of puncture of the labium by a stick, the woman falling in crossing a fence; the other the result of a similar puncture by a piece of china from the breaking of a pot de chambre. Both these cases readily yielded to the recumbent posture and the application of cold and styptic compresses. A very interesting case, the details of which we cannot now find, was published some time ago in one of the journals of the day. A lady, standing upon a chair to mount a horse, slipped and fell, so as to cause the sharp extremity of one of the upright pieces to puncture one labium. Bleeding was profuse, and so obstinate as to require several attempts at checking it before it was finally controlled. This was in the end accomplished by a tampon in the vagina and firm compression by a T bandage.

Causes.—The great predisposing causes are pregnancy, varicose condition of the veins, and a large pelvic tumor. The exciting causes are—

Great muscular efforts;[2]
Blows rupturing the labium;
Incisions or punctures.

Symptoms.—The hemorrhage that announces the accident will lead to a physical exploration, which will at once reveal the nature of the lesion.

Treatment.—The nature of the accident being once recognized, the control of the flow will not usually be difficult. If it be not effected by cold and astringents, such as ice, the persulphate of iron, or tannin, the vagina should be filled with a firm tampon of cotton, a folded towel applied as a compress over the vulva, and a T bandage made to press this forcibly against the body. Should this plan fail, the wound should be enlarged by incision and filled with pledgets of cotton saturated with solution of persulphate of iron; then the tampon should be applied in the vagina and a compress carefully adjusted by means of a T bandage. It is difficult to conceive of any case occurring in the non-pregnant woman which could resist this method if effectually employed.

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[1] *Obstet. Works*, vol. i. p. 277, Am. ed.

[2] Prof. Simpson records a case due to straining at stool.

Pudendal Hematocele.

Definition and Synonyms.—The term thrombus, derived from the Greek *θρομβοω*, "I coagulate," and which is used synonymously with hematoma and sanguineous tumor, is that which is generally applied to this condition. We have preferred the appellation of pudendal hematocele, given to the disorder by Dr. A. H. McClintock, from its pointing out the similarity between it and pelvic hematocele, which resembles it in pathology, and because the term "thrombus" is now commonly applied to the coagulation of blood in a blood-vessel.

A pudendal hematocele is a tumor formed by a mass of clotted blood effused into the tissue of one labium or the areolar tissue immediately surrounding the wall of the vagina.

History.—This disease has been known since the time of Rueff of Zurich in 1554, and has long been recognized as occurring not only during its favorite time of pregnancy, but also in the non-pregnant condition. Velpeau records an instance of its occurrence in a girl of fourteen years.

Pathology.—The pathology of this condition is similar to that of pudendal hemorrhage, which has just received notice, for both are results of rupture of the bulbs of the vestibule. In that which we are now considering the effused blood, instead of pouring away, collects in the tissue of one labium under the vagina, or even in the areolar tissue of the pelvis, and forms a coagulum. It bears to pudendal hemorrhage the same relation which a simple fracture bears to one of compound character.

Rupture of a branch of the ischiatic or pudic artery may, during labor, likewise produce a bloody tumor, but this should not be treated of under the technical head of pudendal hematocele, for it would really constitute a case of subperitoneal hematocele.

Mode of Development.—When a large vessel has been injured a tumor, perhaps the size of an orange, is suddenly discovered at the vulva. At other times the tumor is quite small, not larger than a walnut. The extent of the laceration likewise governs the rapidity with which the tumor forms after the injury has been inflicted. In some instances a slight flow slowly continues until compression from the clot checks it. When the accident occurs in the non-pregnant state, the amount of blood effused is generally less extensive than in pregnancy, and is usually confined to the vulva.

Causes.—The causes are similar to those of pudendal hemorrhage—namely:

Muscular efforts;
Blows injuring the labia;
Punctures by small instruments.

Symptoms.—The symptoms are usually a sense of discomfort, with pain and throbbing, and if the effusion reaches the urethra there is obstruction to urination. The patient or attendant will often first recognize the fact that something abnormal has occurred by the sense of touch, practised without a suspicion as to the nature of the real difficulty.

Differentiation.—Care must be observed not to confound this affection with

Abscess of the labia;
Pudendal hernia;
Inflammation of vulvo-vaginal glands;
Œdema labiorum.

The mere announcement of the possibility of error in diagnosis is all that is necessary, for the physical characteristics, mode of development, and rational signs of these affections are so different from those of pudendal hematocele that examination will always settle the point with certainty.

Prognosis.—If the sanguineous collection be small, it will, especially in the non-pregnant state, generally disappear spontaneously. If, however, it be large, and if the patient have recently been delivered, there are always two dangers to be apprehended. The lesser of these is hemorrhage; the greater, purulent infection through the walls of the cyst or the formation of an extensive abscess, which may produce the same result. These may follow in the non-puerperal form of the affection, but the danger of both is much less great than in the puerperal, where the vessels of the part are largely distended in consequence of excessive growth, and where the blood-state is one of hydræmia and hyperinosis.

Natural Course.—Should the tumor be left to itself, it may be absorbed in a short time and leave no trace; in five or six days it may burst and discharge; the clot may become encysted and remain indefinitely in the tissues; or the irritation of the clot may create suppurative inflammation, and abscess of the labium be the consequence.

Treatment.—Should the tumor be small and not excite much pain, a cooling lotion of lead and opium should be applied, the patient kept quiet, and evacuations of the bladder and rectum regulated in the hope that absorption will take place. As soon as evidences of phlegmonous inflammation around the tumor appear, suppuration and discharge should be encouraged by poultices. When the tumor is large and experiment has demonstrated that it will not undergo absorption, it is advisable to evacuate the blood-clot by incision. This should be done by means of a bistoury upon the mucous face of the labium majus, the patient being placed under the influence of an anæsthetic. After an incision has been made, one finger should be inserted and the clot turned out of its nidus. If hemorrhages ensue, the sac should be thoroughly washed out with a solution of bichloride of mercury, 1:2000, and tightly packed with iodoform gauze, which will check any possible subsequent hemorrhage. This dressing should be renewed every three or four days, or oftener if saturated, the cavity being carefully irrigated each time until it closes by granulation.

Pudendal Hernia.

Anatomy.—By some anatomists it is stated that the round ligaments of the uterus end in the mons veneris, but this view is incorrect. A more careful dissection traces them through the internal abdominal rings, along the inguinal canals, to the labia majora, where they are lost in the dartoid sacs, described by Broca as passing through these folds. The labia majora are unquestionably the analogues of the scrotum of the male, and the round ligaments correspond to the spermatic cords. Into the inguinal canals these ligaments are attended by a prolongation of peritoneum which has received the name of the canal of Nuck. This ordinarily becomes obliterated at full term of fœtal life, but not always. When it remains pervious the formation of inguinal hernia is favored.

Definition.—Down one of the inguinal canals, by the side of the round ligament, a loop of intestine, and sometimes a portion of the mesentery, an ovary, the bladder, or the entire uterus, may pass, as inguinal hernia occurs in the male.

The fact that this disease is by no means frequent makes its recognition the more important, for were the practitioner not aware of the possibility of its occurrence the intestine might be wounded, under the supposition that the labial enlargement was due to abscess or distension of the vulvo-vaginal glands.

Causes.—The displacement may be produced by violent muscular efforts or blows or falls, as in the male.

Symptoms.—On the whole, intestinal hernia does not differ in the symptoms it produces in the female from those caused by the same condition in the male. Strangulation of the intestine with its characteristic signs may occur, although it is very rare. The hernia may usually be overcome by taxis. In one case with which we met reduction was extremely difficult, and could only be accomplished by prolonged effort. When the intestine becomes prolapsed, no strangulation existing, a sense of discomfort upon bending the body, or even upon walking, directs the patient's attention to the affected part and leads her to apply to the physician. By him the nature of the case will at once be suspected from the peculiar gaseous or airy sensation yielded to the touch. Certainty of diagnosis will be arrived at by absence of all signs of inflammation or œdema, the detection of impulse upon coughing and resonance upon percussion, and the possibility of diminishing the volume of the tumor by taxis and position. There are no very great difficulties attending the differentiation of the disease. The danger is that the possibility of hernia at this point may be forgotten, and deductions drawn without considering it. Although the probability of error be not great, the appalling nature of the accident in which it would result warrants the relation of the following case, which is illustrative of its possibility. A patient called upon us with the following history: She had had an abscess just below the external abdominal ring, which, after poulticing, had been evacuated by her physician about a month before the time of her visit to us. After this she had felt well until a week before, when after a muscular effort the pain had returned with all the original signs of abscess, and these had continued, although she had painted the part steadily with tincture of iodine, as she had been directed to do in case of such an occurrence. Being in great haste at the moment, we examined the enlargement while the patient was standing, and under a recent cicatrix, which was painted with iodine, we discovered what we supposed to be a reaccumulation of pus. As the patient came to us, in the absence of her physician, merely for the evacuation of this, we placed her in the recumbent posture, and, lancet in hand, proceeded to operate. But, to our surprise, we discovered that change of posture diminished the size of the enlargement. This excited our suspicions, and we found that a recent hernia had occurred under the old cicatrix.

A few cases are on record of hernia of the uterus even in its early pregnant condition,[1] and instances of hernia of one or both ovaries are not very uncommon.

Treatment.—The patient having been placed upon the back with the hips elevated by a large cushion, or, as is better, by elevation of the foot of the bed or table upon which she lies, the tumor should be grasped, compressed and pushed up the canal down which it has descended, until it returns to the abdomen. Then a truss, so arranged as to press upon the inguinal canal, should be adjusted and worn with a perineal strap, to keep the compress of the instrument sufficiently low down to effectually close the point of exit. Should strangulation have occurred and return of the prolapsed part by taxis prove impossible, the case will require the surgical operation for that condition, for a description of which the reader is referred to works on general surgery. If the prolapsed uterus and ovaries can be replaced by taxis, they should be retained by a truss similar to that described; but if the pregnant organ cannot be replaced, abortion will have to be first induced, and irreplaceable ovaries may have to be removed if they give rise to sufficient discomfort.

Hydrocele.

Definition and Frequency.—This affection, which consists in a collection of fluid in the inguinal canal around the round ligament, is one of such rarity in the female that its very existence is commonly ignored, and mention of it is rarely made by systematic writers.[2] [I myself have met with no instance of this disease; but, rare as it is, it merits a description, if only for the sake of those of our colleagues who may happen to meet with it and will look in vain for information regarding it. Hence I have retained this section unchanged.—P. F. M.].

Anatomy.—It has been already stated that the labia majora of the female are analogous to the scrotum of the male, and that the round ligaments, which are analogous to the spermatic cords, do not end in the mons veneris, as was formerly supposed, but passing downward enter the labia majora and distribute their filaments within the dartoid sacs, which extend like glove-fingers downward toward the fourchette. The interesting and valuable article of M. Broca upon this subject will be found quoted at length in Cruveilhier's *Anatomy*. The peritoneal covering of these ligaments usually extends to the inguinal canals, but occasionally in young subjects it is prolonged through a portion of the canal constituting the canal of Nuck.[1] In adults this is ordinarily obliterated, and hence the rarity of hydrocele and hernia in the female. Sometimes it remains permanently open, when not only may the intestines descend, but even the ovary may pass down, making an attempt to enter the dartoid sacs and imitate the entrance of the testes into the scrotum.

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[1] I saw one such case while assistant to Scanzoni in 1868. The patient was four months pregnant, and abortion was successfully induced by me.—P. F. M.

[2] Scanzoni's work upon *Diseases of Women* contains an account of it.

Pathology.—The affection which we are now considering is the result of excessive secretion on the part of this serous membrane, which, by the fluid collected within it, is distended laterally and downward. Should the abdominal opening of such a sac remain pervious, the fluid thus collecting could readily be forced upward, as in the same affection in the male, but if that opening has become impervious, the fluid becomes sacculated and such return is impossible. So rare is this affection that we offer no apology for the introduction of the following instance of it,[2] reported by Dr. E. P. Bennett of Danbury, Connecticut:

> "In an extensive practice of over forty years but one single case has come under my observation. This case occurred recently in a young married female residing in Putnam county, and was mistaken for a case of inguinal hernia by a surgeon of some eminence, who endeavored to reduce it, but, failing to do so, pronounced it adherent and irreducible, and advised to let it alone. That such a mistake should have been made is not at all surprising, as it was a hydrocele of the round ligament coming down through the inguinal canal, and occupying exactly the place of inguinal hernia, and closely resembling one. She subsequently came under my care, and upon inquiry I learned that about five years since a small tumor had made its appearance, which had slowly and steadily increased in size until it had attained its present size, which was about as large as a turkey's egg. It had not been painful, was not attended with abdominal disturbance, had never receded when recumbent, and gave to the touch a feeling of fluid contents instead of the doughy feel of hernia, and I therefore thought that, whatever it might be, it was not hernia; and upon closer inspection I diagnosed hydrocele of the round ligament, although it was not diaphanous. So sure was I of a correct diagnosis that I at once proposed an operation, to which she readily consented, and with the aid of a professional brother, who coincided with me in my diagnosis, I proceeded to cautiously lay open the sac, when we found, to our great satisfaction, that we had not blundered in our opinion. The serous contents of the sac having been evacuated, I injected it with a saturated tincture of iodine, and she speedily recovered without the supervention of a single unpleasant symptom. This case is only important from its rarity, and the fact that most physicians are not aware that hydrocele can or ever does occur in the female; and my object in writing this article is not to record any remarkable achievement in surgery, but to call the attention of physicians to the subject, and thereby prevent mistakes which might be attended with disastrous results."

A pamphlet has been published upon the subject by Dr. Hart of New York. In it he details an operation for hernia performed in a case of hydrocele from a mistake in diagnosis. The fluid of the hydrocele being evacuated, the wound was closed by silver suture and the patient recovered. He declares that the disease is mentioned by Aëtius, Paré, Scarpa, Meckel, and Poland.

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[1] *Cyclopedia of Anat. and Phys.*, Supplement, p. 706.

[2] *N. Y. Med. Record*, Nov. 15, 1870.

Differentiation.—The greatest circumspection should be observed before a diagnosis of this rare malady is arrived at. The sense of fluctuation, with entire absence of symptoms of inflammation, the absence of resonance on percussion and the ordinary signs of hernia, the existence of translucency, and the gradual development of the tumor without pain or constitutional excitement, would all be reasons for suspecting it. But before ultimate measures are adopted for its cure a very fine exploring needle—such, for example, as that of the ordinary hypodermic syringe—should be passed in, in order that the contents of the sac may be carefully examined.

Should the character of this fluid not assure us that hernia exists, the smallest needle of the aspirator should be introduced and all the fluid drawn off. Even where hernia exists such a procedure has been found to favor return of the sac and to do no harm by rendering it subsequently pervious.

Treatment.—The diagnosis being made, the treatment should consist in evacuation by means of the aspirator, and, if cure do not follow this, in the injection of tincture of iodine in addition, which may be done by reversing the action of the same instrument.

CHAPTER IX.

PRURITUS VULVÆ.

Definition.—This affection consists in irritability of the nerves supplying the vulva, which induces the most intense itching and desire to scratch and rub the parts. Although not itself a disease, it is always so important, and often so obscure a symptom, that it requires special notice and investigation.

Pathology.—It has just been stated that it consists in disorder of the nerves supplying the vulva. It matters not whether this be a true neurosis or one secondary to some other pathological state, the great element of pruritus vulvæ is nervous irritability or hyperæsthesia. That it is often excited by irritating discharges (the saccharine urine of diabetes and acrid utero-vaginal secretions) and eruptive disorders there can be no question. Whether it ever depends upon idiopathic nervous hyperæsthesia, as some suppose, is doubtful. We have never met with an instance in which it appeared to do so.

Mode of Development and Course.—In the beginning the irritability and tendency to scratch are sometimes very slight, so as to annoy the patient very little and give her but trifling uneasiness. Sometimes they exist only after exertion in warm weather, upon exposure to artificial heat, or just before and after menstruation. The disorder is aggravated by the counter-irritation which it demands for its relief. The rubbing and scratching that are practised cause an afflux of blood, render the skin tender and its nerves sensitive, and in time greatly augment the evil by producing a papular eruption. The disease and the remedy which instinct suggests react upon each other, the first requiring the second, and the second aggravating the first, until a most rebellious and deplorable condition is developed. It would be difficult to exaggerate the misery in some of these cases. The patient is bereft of sleep by night and tormented constantly by day, so that society becomes distasteful to her and she gives way to despondency and depression. The itching is generally intermittent, in some cases occurring at night, in others only at certain periods of the day. In two cases that we have met the patients were free from all irritation except at night, when the disturbance and nervous anxiety became so intense as to prevent sleep, except when large doses of opium were given. Loss of sleep, the use of opium, and the nervous disturbance incident to the disease often prostrate and exhaust the patient to an astonishing extent.

This disorder is to some degree paroxysmal, any influence which produces congestion of the genital organs aggravating it very much. Lying in a warm bed, sexual intercourse, eating and drinking, more especially highly-seasoned food and stimulating beverages, and the act of ovulation, all produce this result. Its duration has no limit, months and even years sometimes passing before relief is obtained.

Although the term "pruritus vulvæ" is that ordinarily applied to it, it must not be supposed that the irritation is always confined to the vulva. It often extends up the vagina, to the anus, and down the thighs. In pregnant women we have repeatedly known it to spread over the abdomen. It may be asked why such a state should be styled "pruritus vulvæ"? These extensions are merely complications of the original malady which really deserves that name, and are due to contamination, by scratching, with an ichorous element which constitutes, as we believe, the prominent exciting cause of the trouble.

Causes.—Every practitioner dreads to meet with an aggravated case of pruritus vulvæ, for he knows how obstinate the malady commonly proves. The only reasonable hope of controlling it must rest in viewing it strictly as a symptom and striving to discover and remove its cause. No fixed prescriptions, however much lauded for their efficacy, should be relied upon. The primary disorder should be sought for and cured, in the hope of removing that one of its results which is most pressing in its demands for relief. Should the case have progressed for some time, it will often be found impossible to decide as to its cause, for the scratching induced by it will frequently establish a cutaneous disorder, the connection of which with the pruritus, whether as cause or effect, will be doubtful.

The predisposing causes of pruritus are the following:

Uterine, vaginal, or urethral disease;
Pregnancy;
Depreciated general health;
Habits of indolence, luxury, or vice;

Want of cleanliness;
Severe exercise in one of sedentary habits.

It will be observed that most of these influences are those which predispose to the development of abnormal secretion by the mucous membrane lining the genital tract. Such excessive and deranged secretion we believe to be in the great majority of cases the immediate exciting cause of the nervous irritation. That there are other causes it will be seen that we admit, but to treat this condition successfully we are convinced that special reference must be had to this element. He who simply keeps in view the local trouble, in the majority of cases will be striving merely against the branches of an evil the root of which consists in the ichorous material which bathes and excoriates the terminal extremities of the nerves of the vulva and vagina.

In all the instances of pruritus vulvæ that we have been able to examine early enough to determine as to the etiology we have found one of the following conditions to exist as the apparent cause of the hyperæsthetic condition of the nerves:

1st. Contact of an irritating discharge—
- Acute and chronic endometritis and vaginitis;
- Discharge of cancer;
- Incontinence of urine;
- Diabetes.

2d. Local inflammation—
- Vulvitis;
- Urethritis;
- Vaginitis;
- Follicular ulcers.

3d. Local irritation—
- Eruptions on the vulva;
- Animal parasites;
- Onanism;
- Vegetations on the vulva;
- Vascular urethral caruncles;
- Growth of short, bristly hair on mucous face of labia.

Of all these, endometritis and vaginitis are the most frequent causes. The discharge from these diseases fortunately produces pruritus only as an exception to a rule. Under certain circumstances it appears to possess peculiarly irritating and excoriating qualities, which, even when the flow is insignificant in amount, will excite the most intolerable itching, This feature is most commonly observed in the discharge attending pregnancy and in that of senile endometritis, which covers the vagina with bright red spots and gives it a glazed look like serous membrane.

[In an exceedingly obstinate case occurring in a woman of seventy years, the leucorrhœal discharge was so small in amount that the patient was not aware of its existence, nor did I appreciate its connection with the disorder until I discovered accidentally that the only relief which could be obtained followed the application of a wad of cotton against the cervix uteri. In every case of pruritus the vagina should be carefully investigated for evidence of leucorrhœa, unless some other sufficient cause is apparent. In the same manner the other discharges mentioned may cause nervous irritability in the vulva.—T. G. T.]

We have so often found diabetes accompanied by this symptom that we always examine the urine in obscure cases. It is by many attributed to the constitutional agency of the disease. The marked relief afforded by the systematic use of the catheter has led us to think otherwise. Our impression is that the pruritus is probably not connected with the constitutional effects of the disease upon the nerves, but with the direct and local influence exerted by the disordered secretion, probably in consequence of the fermentation of the saccharine ingredients of the urine.

Local inflammation, by the discharge which it excites and the itching which attends it, is very evidently calculated to give rise to pruritus, and yet cases thus established are not the most rebellious with which we meet.

Any form of eruption upon or around the vulva may, and usually does, excite itching. Eczema, prurigo, lichen, and many others may do so here as they do elsewhere, and the natural warmth of the part, formed as it is of folds of tissue and covered by hair which is thickly interspersed with sebaceous and piliferous glands, makes them the more likely to prove active in causing it.

Animal parasites of two varieties may give rise to it—the pediculus pubis and the acarus scabiei. The first excites through irritation a lichenoid eruption, while the second produces scabies or itch.

One of these causes will generally be found to have given rise to pruritus vulvæ, but it is only in originating the difficulty that it will prove active. Very soon secondary influences, as eruptions, excoriations, ulcerations, and increased discharges, the results of scratching, superadd themselves as auxiliary agents and keep up the disorder.

Treatment.—It has been stated that the first effort of the practitioner should always be to discover the disease of which the pruritus is a symptom, and then to endeavor to remove it by appropriate means. Should leucorrhœa be the cause, the uterine or vaginal affection which gives rise to it should be treated. Should an eruptive disorder be found to be the source of the difficulty, the measures which would be advisable for this affection elsewhere developed—laxatives, baths, change of air, tonics, and arsenic—would be equally beneficial here.

But this alone will not be sufficient. While eradication of the mischief is thus attempted, palliative means must be vigorously adopted for the sake of present relief. Should the case be regarded, upon careful investigation, as due to contact of an irritating fluid with the nerves of the vulva, perfect cleanliness should be secured by three, four, or, if necessary, a larger number of sitz-baths daily, and the vagina should at the time of taking each bath be syringed out with pure or medicated water. The irritated surface should be protected by unctuous substances or inert powders, such as bismuth, lycopodium, or starch, from the injurious contact, and in case the discharge comes from the uterus, a wad of cotton should be placed daily against the cervix uteri to prevent its escape to the vulva, or, as is better, after a thorough use of the vaginal douche the vagina should be tamponed daily with cotton saturated with glycerin, to which has been added borax or acetate of lead, two drachms to the ounce. Of this plan, which we should mention does not confine the patient to bed, we can speak in high terms. While it protects the vulva from ichorous discharges, it does not prevent ablution and applications to the point of maximum irritation. A very useful vaginal injection and wash for the vulva under these circumstances is the following:

℞. Plumbi acetatis,	ʒij;
Acidi carbolici,	℈ij;
Tr. opii,	℥j;
Aquæ,	Oiv.—M.

This may relieve itching for a time, until removal of the cause of the symptom is accomplished.

In case the pruritus is the result of a local inflammation, this should be treated, as elsewhere recommended, by poultices of linseed, potato, or slippery elm, to which have been added a proper amount of lead and opium; or fomentations of lead-and-opium wash or poppy-heads may be used in their stead. If vaginitis or vulvitis be present, great relief will often be obtained by painting the lining membrane of the diseased part with a strong solution of nitrate of silver, or by touching the whole surface very lightly with the solid stick and then using the tampon of cotton and glycerin.

Should an eruptive disorder be the exciting cause, it should, as already stated, be treated upon general principles. Meantime, temporary relief may be obtained by painting the surface of the vulva with a solution of nitrate of silver, or by the use of the ungt. creasoti, ungt. chloroformi, or ungt. atropiæ of the U. S. Dispensatory. Dr. Simpson advises an infusion of tobacco, and Dr. J. C. Osborn[1] of Alabama, in an interesting article upon the medicinal use of this drug, declares that he always resorts to a strong decoction of it as a wash for the vagina and vulva in this affection, and for the anus in "prurigo podicis." According to the latter gentleman, the local sedative effects of tobacco are very useful in the control of prurigo. Our own experience agrees with his.

Although the fact will probably not prove one of practical value, it is certainly one of interest that cases have recently been reported in which smoking tobacco has appeared to relieve pruritus.

[As an illustration I quote the following: "Mrs. W——,[2] a woman of nervous temperament, became pregnant a few months after her marriage. In addition to the usual derangement of the alimentary canal, she soon experienced a severe itching all over her body. The skin was of a perfectly normal appearance; the pruritus, however, caused her great excitement and soon produced nervous spasms. For several weeks every possible external and internal remedy was used in vain. A decoction of walnut-leaves gave her some relief when in the seventh month of pregnancy. Then a violent pyrosis and neuralgia of the dental nerves supervened. In order to alleviate the latter, she was advised by her husband to try the effect of smoking, when the pain as well as the itching and pyrosis disappeared immediately. Mrs. W—— smoked one cigar every evening until she was prematurely delivered by a fright, after eight and a half months.

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[1] *N. O. Med. and Surg. Journal*, Nov., 1866.

[2] *Tribune Med.*, Jan. 31, 1869; *Wiener med. Wochenschrift*, No. 22, 1869.

"Fourteen months afterward Mrs. W—— again became pregnant, and was again affected in the fourth month of pregnancy with pruritus followed by pyrosis. She did not immediately resort to smoking, from the dislike of this habit, until the evil increased, when the smoking of one cigar again rendered her perfectly comfortable."—T. G. T.]

No local application has acquired a more universal popularity in the treatment of pruritus vulvæ than solutions of corrosive sublimate. The following formula is a good one of its kind:

℞. Hydrarg. bichloridi, ʒss;
Tr. opii, ℥j;
Aquæ, ℥vij.—M.
S. For external use only.

Should eczema or lichen have produced inflammatory action in the skin and subcutaneous areolar tissue, poultices, etc. should be employed, as if local inflammation were the cause of the affection.

While these palliative and curative means are being adopted, sleep should be secured by preparations of opium or one of its substitutes, codeine, chloral, hyoscyamus, or chlorodyne. At the same time the general state of the patient should be improved by vegetable and mineral tonics, good food, and fresh air. In some cases more benefit will arise from the use of iron, the mineral acids, and sea-bathing than from any other means.

In certain cases dependent upon chronic vaginitis, or chronic endometritis which has resulted in vaginitis, the disorder will be found to be rather "pruritus vaginæ" than "pruritus vulvæ," and under these circumstances the severity of the local and general disturbance may be very great. In such cases we have found great benefit from the frequent use of copious vaginal injections of warm infusion of bran. The patient, in the semi-recumbent posture, with the nates over a tub containing three or four quarts of this, with from six to eight drachms of laudanum and one to two drachms of acetate of lead dissolved in it, should inject the vagina freely for from ten to fifteen minutes, and this should be repeated four or five times a day. After a short time the soothing and alterative influence which it exerts will show itself so decidedly that less assiduous attention to the disorder will be demanded.

In the same way infusion of tobacco and solutions containing borax, lead, alum, zinc, or carbolic acid will be found to be very valuable remedies. They should be used very freely and after previous cleansing of the vagina by pure water. One great difficulty in the treatment of the disease consists of the inefficient manner in which vaginal injections are practised by patients. This should be guarded against by explicit directions, and the use of the means suggested hereafter in connection with that subject.

The following prescriptions have obtained a reputation for the treatment of pruritus, and we know by experience that they deserve it:

℞. Chloroformi, ʒj;
Ol. amygdalarum, ℥j.—M.
S. Apply to vulva and outlet of vagina.

℞. Acidi hydrocyan. dil., ʒij;
Plumbi diacetatis, ℈j;
Olei cacao, ℥ij.—M.
S. Apply after washing with cold water.

℞. Lotionis nigri, Oj;
Sodæ biborat., ℥j;
Morphiæ sulphat., gr. v.—M.
S. Apply after bathing the part.

℞. Acidi tannici, gr. c;
Belladonnæ ext., gr. x;
Butyr. cacao, q. s.;
M. et ft. supposit. vag., xx.
S. Let the patient place one in contact with the cervix uteri every night, after thoroughly syringing the vagina.

Where diabetes exists as a cause the patient should bathe the parts after urination, and be instructed to keep the vulva thoroughly covered and protected by one of the ointments already mentioned. A reduction of the sugar in the urine by means of the proper dietetic treatment indicated in this disease is essential to permanent relief from the pruritus.

Where the pediculus pubis is found to exist mild mercurial ointment should be applied; and for the acarus scabiei sulphur ointment will be found sufficient as a parasiticide.

When the itching is located in the skin of the mons veneris and surrounding parts, rubbing it freely with a moist stick of nitrate of silver is often of great service.

Where short, bristly hairs are found growing from the inner or mucous surface of the labia majora great relief follows depilation. Each hair should be seized by forceps, the operator using a magnifying-glass, and jerked from its place.

It has been our experience that all cases of pruritus vulvæ dependent upon local irritation are comparatively easy of cure by removing the cause, which is usually possible, except perhaps in very intractable endometritis, which is only too liable to recur. But when there is no local irritation present, and no acrid discharge from the vagina, the skin of the vulva being neither inflamed nor eroded, except by the finger-nails of the patient—that is, where the disease is of a purely neurotic character—we have found local treatment of but little avail, and have been obliged to resort to constitutional remedies, such as the bromides, arsenic, quinine, and iron, and to a change of climate and diet in order to secure any kind of a beneficial result. Morphine and other narcotics should be used with extreme caution in order to avoid an acquisition of the habit.

[Hyperæsthesia of the Vulva.

Definition.—The disease which we proceed to describe under this name, although to all appearances one of trivial character, really constitutes, on account of its excessive obstinacy and the great influence which it obtains over the mind of the patient, a malady of a great deal of importance. It consists in an excessive sensibility of the nerves supplying the mucous membrane of some portion of the vulva; sometimes the area of tenderness is confined to the vestibule, at other times to one labium minus, at others to the meatus urinarius; and again a number of these parts may be simultaneously affected. It is a condition of the vulva closely resembling that hyperæsthetic state of the remains of the hymen which constitutes one form of vaginismus. In two cases I have seen the whole surface of the vulva, except the labia majora, affected by an excessive sensibility which extended along the urethra.

Frequency.—This disorder, although fortunately not very frequent, is by no means very rare. So commonly is it met with at least that it becomes a matter of surprise that it has not been more generally and fully described.

Pathology.—It is not a true neuralgia, but an abnormal sensitiveness—"a plus state of excitability"—in the diseased nerves. No inflammatory action affects the tender surface, no pruritus attends the condition, and physical examination reveals nothing except occasional spots of erythematous redness scattered here and there. The nerve-state appears identical with that which sometimes develops in the scalp and on parts of the cutaneous surface. The slightest friction excites intolerable pain and nervousness; even a cold and unexpected current of air produces discomfort; and any degree of pressure is absolutely intolerable. For this reason sexual intercourse becomes a source of great discomfort, even when the ostium vaginæ is large and free from disease. It is this difficulty which generally first causes the patient to apply to a physician for relief.

Causes.—The predisposing causes appear to be the period of life near or at the menopause, the hysterical diathesis, or a morbid mental state characterized by tendency to depression of spirits. As exciting causes I have found chronic vulvitis and irritable urethral tumors to exist in some cases, but in others no cause whatever has been apparent.

Symptoms.—I have said so much on this subject under the head of Definition that I have little more to add. The patient applies for relief because the act of sexual intercourse is painful, and because in the sensitive spot there is always a degree of discomfort which is increased by bathing the part or even by the friction incident to walking. Upon questioning her, it will be observed that her mind is disproportionately disturbed and depressed by this. In some cases it seems to absorb all the thoughts and to produce a state bordering upon monomania.

Differentiation.—It should be distinguished from irritable urethral tumor and vaginismus, which will be readily accomplished by inspection and touch.

Treatment.—The treatment of this condition is most unsatisfactory. I have met with a number of cases of marked character, and in not one was complete relief given by treatment. Whether they subsequently recovered I cannot say, but they certainly were not cured while under my observation. In one case, which I saw with Dr. Metcalfe, the sensitive area was the vestibule, and to this I applied nitric acid so as to destroy the mucous membrane completely, and followed this up by local sedatives, but to no purpose. In another, which I attended with Dr. Sims, he removed portions of the labia minora and of the vulvar mucous membrane, without success. In another case I dissected off all the sensitive tissue, which was quite extensive. This patient, the wife of a clergyman, left me well, and was greatly rejoiced; but in six months I received a letter from her declaring that she was worse than before the operation. The treatment which I would recommend from my experience is this: to send the patient away from home, where, in addition to enjoying change of air, scene, and surroundings, she would live *absque marito;* to put her upon the use of general tonics, as arsenic, strychnine, quinine, and iron; and after having cured any local exciting disease, like vulvitis or urethral vegetations or tumors, to make frequent ablutions with warm water, and apply sedative and calmative substances in the form of lotions or ointments. As examples of these, I would mention opium or its salts, carbolic acid, chloroform, belladonna, and iodoform. Sometimes benefit seems to result from strong solutions of alum, tannin, and similar agents.

My observation of the results of caustics and the knife is not such as to inspire me with confidence in them.][1]

Irritable Urethral Caruncle.

Just at the edge of the meatus urinarius, and sometimes along its walls for some distance, little vascular tumors develop themselves, which render this canal very irritable, and in this way produce a great deal of discomfort.

Pathology.—They consist of hypertrophied papillæ, which as they enlarge are accompanied by excessive growth of areolar tissue. They are extremely vascular, capillary vessels of considerable size being found within them ramifying in transverse sections, very much like the *vasa vorticosa* of the choroid. They are richly supplied with nervous filaments. These two anatomical facts account for two corresponding clinical observations—that they bleed very freely and readily, and that they are almost as sensitive to the touch as a neuroma.

Causes.—Of the etiology of this affection nothing is known. It develops in the young and old, the married and single. Probably irritation by some pathological form of urine has much to do with the growth of the caruncles.

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[1] I have never seen an instance of this disease, but Dr. Thomas assures me of its undoubted occurrence in his practice. Hence I reproduce this section unchanged.—P. F. M.

Symptoms.—The patient complains of pain upon sexual intercourse, in passing urine, in walking, and upon the slightest contact of the clothing. She is disturbed by these means and by the increase of sensitiveness engendered by the warmth of the bed. As a consequence she becomes nervous, hysterical, and greatly depressed in spirits. Her whole thoughts often become fixed upon this one painfully absorbing topic, and a most wretched mental state is at times produced. Of course these grave results occur only in very aggravated cases, but even in minor ones they are present in slight degree.

[Dr. T. F. Cock informed me of a case in which a patient became so much depressed from this cause that she committed suicide, and I have a similar statement of another case from a non-professional source. In the latter the time had been appointed for the removal of the growth when the patient destroyed her life.—T. G. T.] We should be sorry to leave the impression that mental alienation of grave character is likely to develop from these little growths; it is not. A certain degree of it is very apt to be met with, and in rare cases, where the suffering is very great, it sometimes becomes excessive.

Physical Signs.—The patient being placed upon the back with the thighs flexed and the knees separated, inspection shows at the meatus urinarius a florid, vascular growth varying in size from that of a cherry-stone to that of a pigeon's egg. Scanzoni declares that they may grow to the size of a goose's egg. Sometimes, instead of one, quite a number may be found, of small size, extending around the meatus or up the canal. Where the canal itself is invaded the cases are always very difficult of cure, on account of the difficulty in reaching the morbid developments.

Differentiation.—There are but two conditions with which we have ever known the disease confounded. One is prolapsus urethræ or eversion of the mucous membrane of the canal; the other syphilitic growths of warty character. From the first a careful examination will readily distinguish it, and when the second exists similar developments will be found upon other parts of the vulva. Besides, neither of these conditions is nearly so annoying and painful as that which we are considering.

Course and Duration.—It is impossible to say how long these growths will continue to exist when not interfered with. We have known them last for years without continuing to develop, but retaining a small size and being always excessively sensitive and annoying. On the other hand, we have seen many cases in which the growths were neither sensitive to touch nor gave the patients the slightest inconvenience.

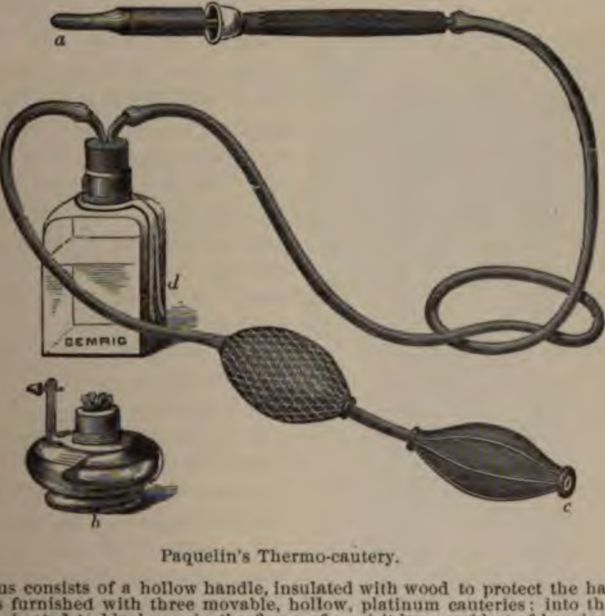
Prognosis.—In case a single large caruncle exists, an almost positive promise of relief may be held out from its removal; but where a number of small, fungous, warty growths surround the meatus and extend up the urethra, cure is extremely difficult, for no sooner are they removed than the morbid process of development rapidly produces more. Another discouraging feature of these cases is this: a nervous hyperæsthesia is engendered by the growth which lasts long after its removal. In order to ensure a permanent cure the diseased condition of the urine, or of the bladder (chronic cystitis) upon which the abnormal urine depends, must be rectified. An irritable condition of the urethra and the neck of the bladder is liable to follow the removal of the caruncle for some time, and it is well to notify the patient of this probability.

Treatment.—Before operating the patient should be thoroughly anæsthetized and placed upon the back, with the thighs flexed and the knees widely separated. The labia being then separated by an assistant on each side, the tumor should be seized near its base by forceps, pulled toward the operator, and its attachment cut by scissors. Very free hemorrhage may occur. To control this, the raw surface should be wiped dry and thoroughly touched with fuming nitric acid, a stick of nitrate of silver, or the actual cautery.

This operation may be very nicely performed by galvano-cautery, if an instrument be attainable. By this means not only is hemorrhage prevented, but the base is also thoroughly cauterized, which is a great safeguard against return of the growth.

Where the urethra has been invaded it should be thoroughly stretched by little retractors introduced within it and held by assistants, and the growths thus exposed be cut off by scissors or scraped from their attachments by a steel curette. After removal their bases should be very cautiously touched with nitric acid, or, what is still better as preventive of return, the actual cautery. A few years ago the actual cautery was an instrument so unmanageable and difficult of employment that it was rarely used for slight operations. Now, thanks to the genius of

FIG. 52.



Paquelin's Thermo-cautery.

The apparatus consists of a hollow handle, insulated with wood to protect the hands from the heat. It is furnished with three movable, hollow, platinum cauteries: into these, after they have been heated to blackness in the flame of a spirit lamp, a blast of benzine vapor is introduced by means of a Richardson's spray bellows, which at once raises them to, and maintains them at, a state of vivid incandescence. The heat thus produced can be kept up for an indefinite time by slightly compressing the bellows occasionally.

Paquelin, whose instrument is shown above, it is used as easily as the stick of nitrate of silver.

To avoid as much as possible the distressing tenesmus of the neck of the bladder which is almost sure to follow this operation, we usually dilate the urethra with uterine dressing-forceps or the steel two-branched dilator to a sufficient width to permit the introduction of the little finger into the bladder; and not until this has been done do we apply the caustic or cautery.

Urethral Venous Angioma.

This is a disease affecting the urethro-vaginal tubercle or anterior half of the urethro-vaginal septum. It sometimes attains a large size and projects between the labia. From irritable caruncle or vascular excrescence it can be differentiated by its want of sensitiveness.

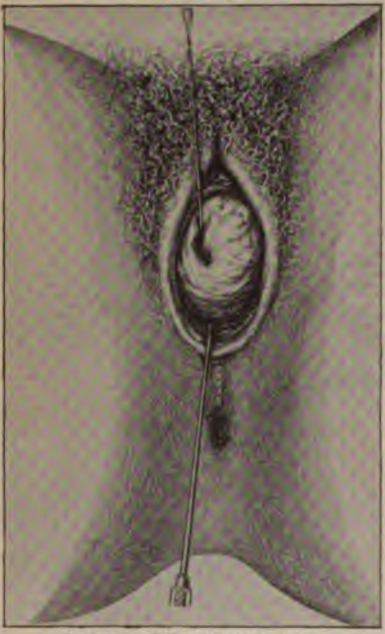
It appears, says Savage,[1] to be due to venous congestion, analogous to that giving rise to priapism.

Its treatment is identical with that of urethral caruncle.

Prolapsus Urethræ.

This accident, which has likewise been described as procidentia and eversio urethræ, consists of prolapse of the urethral mucous membrane, with proliferation of the underlying connective tissue. It is not commonly met with, but at times produces considerable irritation of the urethra and bladder, and leads to an erroneous diagnosis of irritable caruncle. We have met with it in adults of enfeebled constitution and advanced age and in little girls before the age of puberty. Diagnosis is easy. A roseate projection encircles the meatus, which is sensitive and liable to bleed. The only diseases with which it could be confounded are irritable caruncle, urethral polypus, venous angioma, and epithelioma. From all these it can readily be differentiated by careful examination, which shows that it entirely surrounds the meatus, while they do so only in part. The extreme sensitiveness of irritable caruncle is not a differential sign which can be relied upon, for we have seen prolapse of the urethra develop this symptom very decidedly. It may for some time exist without symptoms, but usually soon creates difficult and painful micturition, pruritus vulvæ, and leucorrhœal discharge.

FIG. 53.



Prolapse of Urethra (Mundé).
From a girl nine years of age. Upper sound is in the urethra, lower in the vagina.

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[1] Savage, *op. cit.*

Treatment.—The simplest method of treatment is to seize the prolapsed circle with tooth-forceps, the patient being anæsthetized, draw it down with very little force, and cut it off with curved scissors. The resulting hemorrhage is controlled and the calibre of the meatus maintained intact by stitching the edge of the mucous membrane of the urethra to that of the mucous covering of the vestibule all around the opening. If able, the patient may pass water or it may be drawn by a catheter.

In one case we drew down the prolapsed tissue, passed a double silk ligature through its base, and tied the two halves. The cure was perfect.

Should obstinate hemorrhage follow any of these operations upon the urethra or vulva, a firm vaginal tampon with a T bandage, used so as to press its lowest portion against the bleeding surface, will readily control it. The former presses the urethra upward and the labia outward, while at the same time it gives a firm, fixed point, against which direct pressure by a T bandage and compress may be made. It possesses more real value than all the other means usually mentioned for the control of such hemorrhages combined; such, for example, as Monsel's salt, the actual cautery, strong acids, etc. The vulva is so exquisitely sensitive that the patient is apt to rebel against these, and in addition they often fail in accomplishing the result.

Cyst and Abscess of the Vulvo-vaginal Glands.

Anatomy.—Just anterior to the hymen, or the carunculæ myrtiformes, will be found on each side a little opening sufficiently large to admit a small probe or bristle. This opening leads through a canal three-fifths of an inch long, which is the excretory duct of a conglomerate gland which has received the name of the vulvo-vaginal gland. These glands are found on each side of the ostium vaginæ, between the vagina and the ascending branch of the ischium, from which they are distant three-tenths of an inch, and lie in contact with the transverse artery of the perineum. The fact that they are separated from the vagina by an aponeurotic prolongation, lie between the superficial and middle layers of the ischio-pubic fascia, and have the unyielding ischium on one side, accounts for the complete confinement of pus forming in them and its not being discharged by the rectum or vagina. They were described by Duverney, Bartholin, Morgagni, and their immediate successors, but in time, very singularly, they were forgotten. In 1841, M. Huguier of Paris redescribed them fully and threw much light upon their diseased conditions.

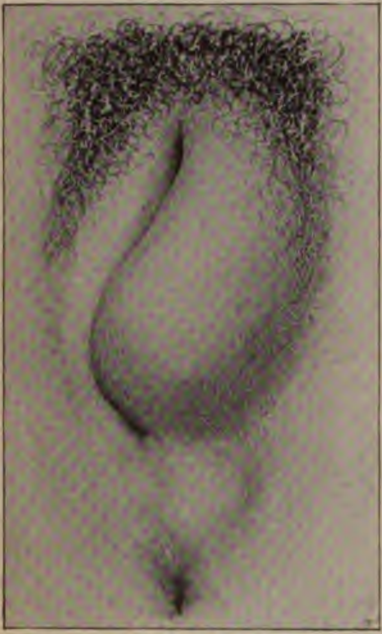
Sometimes, their mouths becoming occluded by adhesive inflammation, their secretion is retained, and they undergo great enlargement and distension. At other times suppurative inflammation is set up and abscess is the result.

Causes.—The causes of inflammation of these glands are very much the same as those of vulvitis, of which, indeed, this affection is often a concomitant disorder.

Symptoms.—These are heat on the affected side of the vulva, pruritus, and pain upon touch. The mouth of the duct is red, and the finger pressed over the site of the gland discovers a hard, painful, and perhaps fluctuating tumor about the size of a small hen's egg. Very often the first intimation of the existence of the disease is given by pain during the sexual act or upon manipulation.

Differentiation.—An abscess of this gland is generally readily distinguished from a cyst by the presence of the ordinary signs of inflammation, or, when cystic distension exists without inflammation, the locality of the round mass rolling slightly under the finger without tenderness will make the diagnosis clear. From phlegmonous inflammation of the labium majus it will be known by its distinct, globular, and limited outline, the former affection being diffuse. Furuncles are entirely too superficial to create confusion in diagnosis.

FIG. 54.



Abscess of the Vulvo-vaginal Gland.

Course and Duration.—The disease is one of no great moment, and its natural tendency is to recovery. Its usual duration is from two to three weeks, and the inflammatory process may terminate either by resolution or by suppuration. Should the latter occur, the pus may be discharged through the ducts of the gland or in the furrow between the labia minora and majora. In some cases, however, the gland becomes filled with a honey-like matter, and exists as a cyst for months and even for years.

Treatment.—When inflammation affects the cyst-wall an emollient poultice or cooling and anodyne lotion should be kept applied to the vulva, and rest should be prescribed until suppuration has occurred. Then, as soon as fluctuation is distinct, the accumulated pus should be evacuated by a long incision, extending from top to bottom of the inner face of the labium, and the cavity irrigated with a weak sublimate solution and packed with iodoform gauze. To allow the abscess to open and heal spontaneously usually means its return in a few months on the occurrence of the slightest irritation of the parts, and this return may take place again and again at irregular intervals until finally the abscess is opened and radically treated.

When retention of the contents of the gland has created a cyst unattended by suppuration, or when frequent return of suppurative action renders a radical procedure necessary, it has been advised to extirpate the gland. This is a bloody operation, as the transversus perinei artery is apt to be severed. In all our experience we have never found extirpation necessary, and have practised in its stead the procedure which we shall now describe:

Catching up the mucous membrane over the sac, we cut out with scissors an ellipse. This exposes perfectly the wall of the sac, which is punctured by the tenaculum, so as to allow the escape of a small amount, say one-third, of its contents. The sac-wall is now lifted by the tenaculum, and an elliptical piece is cut out of that also. This prevents closure and secures drainage. The cavity is now filled with carbolized cotton or iodoform gauze, which in thirty-six or forty-eight hours is removed. In obstinate abscesses and in cysts we usually swab the cavity with tincture of iodine before packing it, and occasionally scrape it first with the sharp curette.

Coccygodynia.

Definition and Frequency.—This affection consists in a morbid state of the coccyx or the muscles attached to it, which renders their contraction, and the consequent movement of the bone, very painful. It is of frequent occurrence, numerous cases having been observed, since attention has been called to it, by practitioners who saw it previously without regarding it as a special disorder.

History.—Coccygodynia was first described in 1844 by the late Dr. Nott. Under the name of neuralgia of the coccyx he described a case which fully embodies the symptoms and treatment of the affection by surgical resource.[1]

Although Dr. Nott gave every detail with which we are now familiar as to the symptomatology and treatment of this affection, the subject was nearly forgotten until the year 1861, when it was again described, almost simultaneously, by Simpson of Scotland, who gave it its name, and Scanzoni of Germany. We have in this another instance, of which so many exist, of the complete oblivion into which a few years may cast a valuable contribution to science. Surely in such a case he who revives what is forgotten deserves as much credit as he who originally made the discovery.

Anatomy.—The coccyx serves as a point of attachment for the greater and lesser sacro-sciatic ligaments, the ischio-coccygei muscles, the sphincter ani, levatores ani, and some of the fibres of the glutei muscles. These are thrown into activity by certain movements, as rising from the sitting into the standing posture, the act of defecation, etc.; and in such acts the existence of the disorder which we are considering is revealed.

Pathology.—The peculiar pain which characterizes this disease has, according to our experience, a variety of causes: we have removed one coccyx in which a fracture with dislocation received in early life, which caused it to jut in at a right angle to the sacrum, was its source; another in which, as in Dr. Nott's case, just recorded, caries existed; while in still a third no abnormal condition could be discovered. In such cases as the last the pain which characterizes it is probably due to a hypersensitive state of the fibrous tissues surrounding the coccyx or of that making up the tendinous expansions of the muscles. This may at times be, as Prof. Simpson has suggested, of rheumatic character; but it appears to us that it is very generally a neuralgic state, due to uterine or ovarian disease, of which coccygodynia is a frequent consequence.

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[1] *N. O. Med. Journ.*, May, 1844.

As a rule, so long as the bone is uninfluenced by contraction of the muscles attached to it, no pain is experienced, but as soon as contraction produces motion it is excited.

Causes.—It occurs most frequently in women who have borne children, but it is by no means confined to them. We have on two occasions met with it in young unmarried ladies, and Herschelman reports two cases in children from four to five years of age.

Its chief causes are the following:

Blows or falls upon the coccyx;
Injuries inflicted by parturition;
The influence of cold and exposure;
Uterine and ovarian disease;
Horseback exercise;[1] (?)
Neurasthenia.

In a case mentioned by Courty the patient had the peculiar habit of sleeping with the buttocks uncovered and the sacrum pressed against the wall. In 9 of Scanzoni's cases the condition followed parturition; in 5, the use of the obstetric forceps; and in 2, horseback exercise was the only cause ascertainable.

A typical symptom of that common female disease of the present day, general nervous exhaustion or neurasthenia, is pain in the coccyx. This pain is complained of as much in the morning after a night's rest as at night, when one would expect to hear of it after a fatiguing day. It is usually associated with the other typical pains of neurasthenia in the cervical and dorsal regions of the spinal column. A careful examination reveals no pathological change in the bone.

Symptoms.—The patient upon sitting down, rising, making any effort, or passing feces experiences severe pain over the coccyx. In some cases this is so severe as to cause the greatest dread of sudden or violent movement. In others the patient is unable to sit, on account of the discomfort caused by pressure on the bone. The most trying process is that of rising from a low seat, and to accomplish this the sufferer will obtain all the aid that is practicable by assistance with the hands, which will be placed as auxiliary supports upon the edges of the chair or stool upon which she rests.

Differentiation.—The only conditions with which this may be confounded are painful hemorrhoids, fissure of the anus, and a spasmodic condition about the muscles of this part due to ascarides in the rectum. From these a careful and thorough physical examination will always readily distinguish it.

Prognosis.—Coccygodynia often lasts for years, annoying and distressing the patient, but never to any degree depreciating her health or constitutional state. If left to nature it may wear itself out, but it is probable that it would generally remain for a long time if not relieved by art.

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[1] Scanzoni, *op. cit.*

Treatment.—Before any plan of treatment is adopted care must be taken to discover whether the disorder is secondary to uterine disease or anal fissure. If it be so, the primary disorders, and not their results, should receive attention.

If the coccygeal disease be primary, blistering, the use of morphia by the hypodermic method, and the persistent use of the galvanic current will often effect a cure. While they are being tried the use of iodoform as a rectal suppository may be employed with advantage, together with all general means calculated to improve the tone of the nervous system.

Should these means do no good and the patient's condition demand relief, recourse should be had to one of two radical methods of cure—section of the diseased muscles or excision of the bone to which they are attached. The first, placed at our disposal by the late Prof. Simpson, consists in severing the attachments of all the coccygeal muscles; the second, in extirpating the coccyx itself, after the plan of Dr. Nott.

The first operation may be performed subcutaneously by an ordinary tenotomy-knife. This is passed under the skin at the lowest point of the coccyx, turned flat, and carried up between the skin and cellular tissue until its point reaches the sacro-coccygeal junction. Then it is turned so that in withdrawing it an incision may be made which entirely frees the coccyx from muscular attachments. The knife is then introduced on the other side so as to repeat the section there. As is usually the case in subcutaneous operations, no hemorrhage occurs unless some large vessel be injured. We have resorted to this procedure but once, when we found it exceedingly difficult of accomplishment, and it proved an entire failure in giving relief.

In fat women subcutaneous section of the muscles attached to the coccyx is by no means so easy a matter as one would suppose who has not made the experiment. Under these circumstances the operation is simplified and rendered more certain by making an incision down upon the coccyx, lifting the exposed extremity of this bone with the finger, and then with a pair of scissors severing the muscles. This procedure is both easy of performance and certain as to result; that is, supposing that it is resorted to in a case really demanding it.

Should detachment of the muscles fail, as it will do if the bone be diseased, an incision should be made over the coccyx, the bone laid bare by severance of attachments, and the whole of it removed by a pair of bone-forceps or disarticulated by the knife. By one of these procedures cure can be confidently promised, and as neither is attended by danger our resources in this affection may be regarded with great satisfaction.

Many slight cases of coccygodynia occur, however, which pass away with time and palliative treatment. The gynecologist should take care that operation is not resorted to too early. In fact, increased experience with these cases has led us to restrict removal of the bone almost wholly to instances where it is diseased, fractured, or dislocated. To remove a coccyx for pain, which is but a symptom of general spinal hyperæmia and constitutional nervous depression, is obviously illogical.

CHAPTER X.

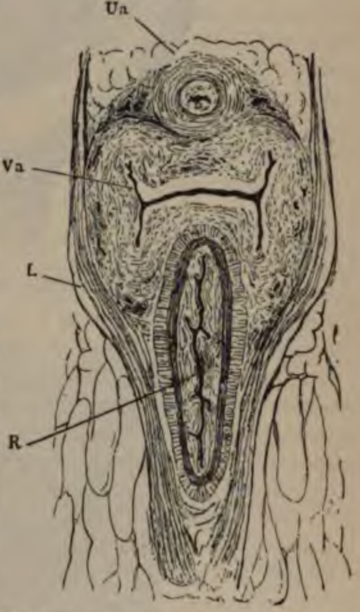
THE FEMALE PERINEUM: ITS ANATOMY, PHYSIOLOGY, AND PATHOLOGY.

FORMERLY there existed very generally throughout the profession a difference of opinion as to whether a laceration of the perineum should be immediately repaired or not, or, indeed, whether such an injury was worthy of repair at any time. This doubt was due partly to imperfect and careless observation by the attending obstetrician or by the gynecologist under whose care the case came later on, and partly to a confused and faulty comprehension of the normal anatomy of the parts involved and of the manner in which their repair should be brought about. Hence many cases even of aggravated laceration of the perineum were allowed to go untreated for years, their unfortunate possessors suffering from prolapsus of the vagina and uterus, and even from fecal incontinence, all of which might have been cured very readily by a plastic operation. It is true, operations for this injury have been devised for nearly one hundred years, chiefly by the Germans, of whom Dieffenbach and Langenbeck the elder proposed ingenious methods, which, however, were never generally adopted. Baker Brown and Savage again revived and perfected the operation, being followed by Sims, Emmet, and others, including ourselves, in this country. At the present day, chiefly as a result of the researches of the past twenty years, the subject of laceration of the perineum and its operative treatment has been thoroughly studied by gynecologists throughout the civilized world, and in consequence of a more thorough understanding of the anatomy of the part and the evil results following the failure to close rents of any magnitude, the necessity for, and the technique of, the operation have gradually become more and more understood, until now there seems very little left to be learned on the subject. By the older authors not much is said of the texture of the perineum, except to pronounce it the floor of the pelvis, the space extending from the posterior commissure of the vulva to the anus, and composed of skin, cellular tissue, tendinous union of muscles, fat, and bounded above by the posterior wall of the vagina and below by the anterior wall of the rectum. Nothing definite is said as to its function, and still less as to the results of its destruction and the method of its repair. From these old descriptions we hardly know in what light to look upon the female perineum; from them it would appear to be simply a septum between the vagina and the rectum. We are indebted, we believe, to Dr. Savage of London for the demonstration of the fact that the perineum—or rather the perineal body, as we prefer to call this important part—is in the female a triangular wedge composed of muscles, fascia, and areolar tissue which fills the space intervening between the backward curve of the rectum and the forward curve of the vagina. It was Savage who first called this triangle the perineal body, and for the sake of convenience and the correct understanding of its shape and functions we have retained this term.

In order to show the student how incorrectly former textbooks have portrayed the relations of the pelvic organs of the female we have preserved the following figure (Fig. 56). The bladder, the vagina, and the rectum are there all shown in their expanded condition—a state of things which certainly never exists when these organs are empty. In nature, unless the bladder or rectum be full, they are usually in a more or less collapsed condition, and the walls of the vagina, instead of gaping as in the cut, are in apposition, except when distended by some foreign body. The anterior vaginal wall rests upon the posterior, and is sustained by it. The gentle passage of a small cylindrical or Sims speculum will make this fact quite evident.

A vertical transverse section of the vagina made on a frozen subject by Henle is represented in Fig. 55.

FIG. 55.



Vertical Transverse Section of the Soft Parts at the Pelvic Outlet: Ua., Urethra; Va., Vagina; R., Rectum; L., Levator ani (Henle).

Our idea of the true relations of the vagina, bladder, uterus, rectum, and perineum to each other is represented in Fig. 57, which at first sight would seem to resemble the diagram in Fig. 56, but there are a number of important differences: the uterus is lower in the pelvis, more inclined forward, and the vagina, instead of consisting of a canal with a single curve from behind forward, presents a double curve—first, a decided curve, from behind forward, and second, a very slight one, from above downward and backward. Our delineation of the perineal body may seem exaggerated, but practically it is true, as can be easily verified by enclosing the part between the index in the rectum and the thumb in the vagina in any well-formed and well-nourished nulliparous woman. This triangle is bounded in front by the posterior vaginal wall, behind by the anterior rectal wall, and below by the skin extending from the posterior commissure to the anterior margin of the anus. Just above the upper angle of the triangle the vagina shows a depression into which the cervix projects, so that the finger in the rectum reaches the cervix much more easily than if passed into the vagina. It was intended in our cut to show the rectum and bladder empty with their walls in apposition. But this was found to be impracticable if the normal proportions of these movable organs were to be preserved. Of course this is but a schematic diagram; indeed, it would be almost impossible to give a representation of the absolutely normal relations of these organs, since they are generally in a condition of mobility, owing to the difference in the fulness of the rectum and bladder and the normal mobility of the uterus during every voluntary motion and the functions of inspiration and expiration. We have merely

FIG. 56.

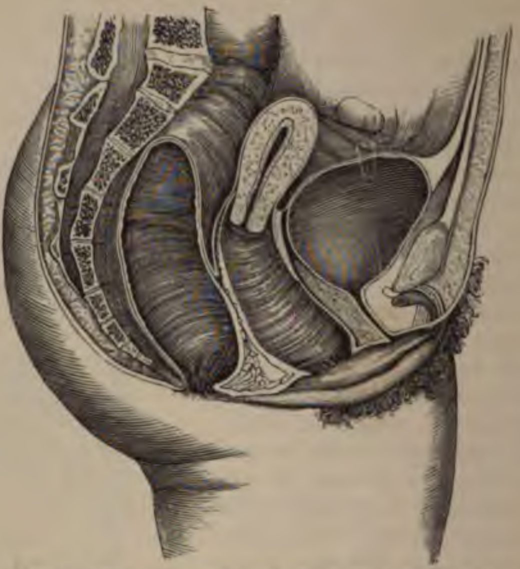
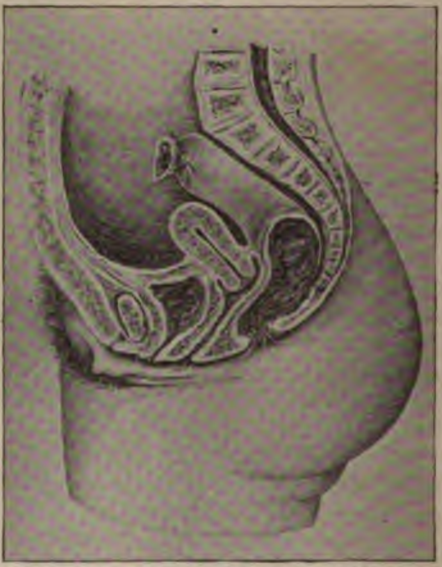


Diagram ordinarily used for Representing the Perineum.

FIG. 57.



Normal Topography of Female Pelvic Organs (diagrammatic).[1]

depicted the organs as they would be likely to appear in a state of comparative rest.

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[1] Even in this otherwise correct plate the rectum should be collapsed and its walls in contact.

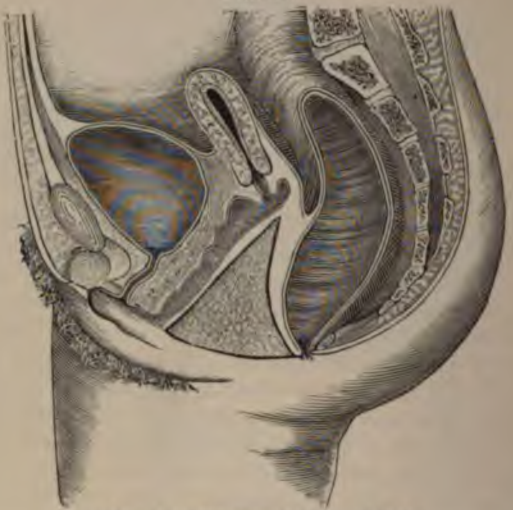
If the perineal body just described be regarded merely from a mechanical point of view as an inactive mass of tissue, its influence in the co-ordination of pelvic support may well be doubted. Let it be remembered that it rests inferiorly upon a set of muscles whose union occurs at the space between the anus and vulva. The contraction of these throws the perineal body forward and upward, presses it against the anterior wall of the vagina, and thus makes of it an active agent in giving support. In some cases this action is so strong as to become abnormal and to cause dyspareunia, or to render coition entirely impracticable. So marked is this at times that the perineal body has to be cut through by the knife to overcome the difficulty.

We are now prepared to appreciate the functions of the female perineum or perineal body; for we feel that the whole triangle must be described as the female perineum if we ever intend to inculcate true, rational, and reliable precepts as to management of this part during labor and in reference to uterine displacements. Its functions are the following: 1st, it sustains the anterior wall of the rectum, and prevents a prolapse of this, which would inevitably drag downward the upper vaginal concavity, and with it the cervix uteri, and destroy the equilibrium of the uterus; 2d, it sustains the posterior vaginal wall, and prevents a prolapse of this, which would allow of rectocele; 3d, upon the posterior vaginal wall rests the anterior, upon this the bladder, and against the bladder the uterus, all of which depend in great degree for support upon the perineal body; 4th, it preserves a proper line of projection of the contents of bladder and rectum, and thus prevents the occurrence of tenesmus, a frequent cause of pelvic displacements.

Before proceeding to state the consequences and results, immediate and remote, of laceration of the female perineum, we wish our position in regard to this portion of the female pelvic organs to be distinctly understood. We do not regard the female perineum as a separate part of the pelvic organs, but merely as a combination of muscles, areolar tissue, fat, nerves, and vessels, the muscular portion of which combination unites in the central raphé, as the line extending from the posterior commissure to the sphincter ani is generally called. The chief force of the perineum lies in its muscles and their median attachments. The most important of these muscles are the two deep transversus perinei or levatores ani, which meet in the upper portion of the median line of the perineum, are attached on either side to the ramus pubis, and extend about two-thirds up the posterior wall of the vagina, encircling the posterior half of that canal. The cutaneous and subcutaneous portion of the perineum may be entirely destroyed down to the sphincter ani, without in any way disturbing the position or relations of the vagina or uterus, always provided that the junction of the levatores ani is not severed. If these are injured, or even if their union is merely relaxed, the posterior wall of the vagina undergoes subinvolution, remains redundant, and as a rule gradually prolapses.

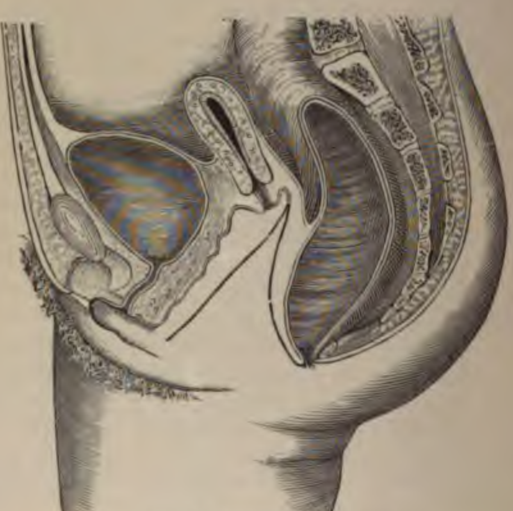
In the last edition of this work we endeavored to explain the support given to the rectum, bladder, and uterus by a diagrammatic triangular wedge shoved in between the rectum and bladder, and which we have designated as the "*perineal body*," by comparing it to the inverted keystone of an arch; and, acting on this theory, we constructed several diagrams represented in that edition in support of our views.

FIG. 58.



Schematic Diagram of Perineal Body.

FIG. 59.



The same, Perineal Body removed.

We have since come to the conclusion that this position is not based upon sound anatomical principles and not entirely tenable. While we have, therefore, retained the diagrams which show our view of the action of the "perineal body" in its relations to the other pelvic organs and the effects following its removal—namely, destruction of the attachments and loss of support of the bladder and rectum—we do not wish to be understood as still considering this triangular wedge of muscles, fascia, etc. between the rectum and vagina in the same light as we did when we wrote our last edition. We know that the diagrams are entirely schematic; we know that the perineal body as there represented does not actually exist; we know further that as it is there illustrated it can impossibly be entirely restored by any plastic operation; and still we feel that the student, to whom so many conflicting statements and ideas are now presented by authorities to whom he is accustomed to look up

Fig. 60.

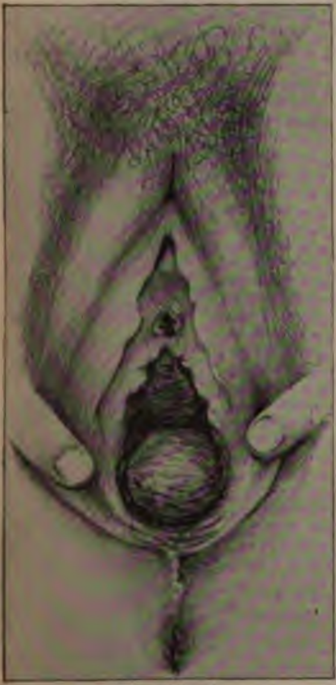
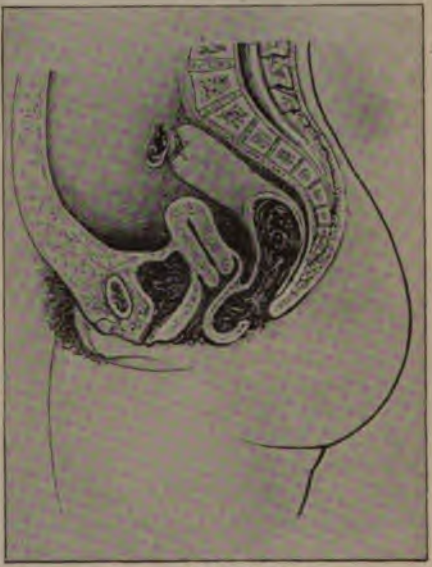


Fig. 61.



Front View.[1] Section View.

The Perineal Body destroyed, the Rectal Wall descends.

with veneration, will understand far better what the loss of the support of the perineum to the superincumbent pelvic organs of the female entails, and how culpable is his failure to restore this part to its normal condition, so far as lies within his power, if he sees, even in an exaggerated degree, the important functions which this organ fulfils. In many of the later books on the diseases of women laceration of the perineum is merely spoken of as the separation of the tissues situated between the vagina and rectum. This injury is looked upon as a direct traumatism produced usually by parturition, the diagnosis, results, and treatment of which are exceedingly simple, and very few pages are devoted to the discussion of the anatomy and physiology of the peri-

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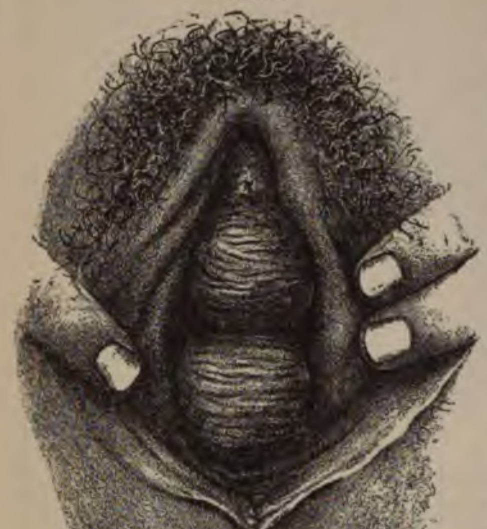
[1] The perineum in this cut should be shown more deeply lacerated.

Fig. 62.

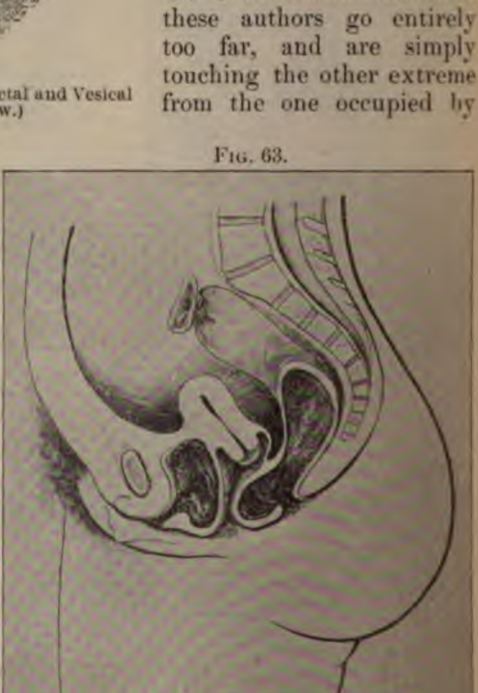


The Perineal Body destroyed, both Rectal and Vesical Walls descend. (Front view.)

neum. By the German authors chiefly the accident is considered mostly from its surgical aspect, and the efforts of the operator are directed mainly toward restoring the part to its normal condition.

A number of recent authors have taken the ground that the perineum is of no particular consequence any way, and that its presence or absence does not materially influence the well-being of the woman. Hence they deride any attempt to attach special value to it and its functions, and endeavor to substitute for it the two muscles which we have already mentioned—the levatores ani. We think these authors go entirely too far, and are simply touching the other extreme from the one occupied by those writers who believe the loss of the perineum to be responsible for every displacement of the uterus and vagina. We shall complete our remarks on the necessity for the operative restoration of the perineum in the chapter devoted to that subject.

Fig. 63.



The Perineal Body destroyed, both Rectal and Vesical Walls descend. (Section view.)

The perineal body may lose its tonicity and efficiency from the following causes:

1st. From constitutional feebleness;

2d. From feebleness the result of prolonged over-distension;

3d. From subinvolution;

4th. From senile atrophy;

5th. From laceration.

In a very few cases, in

girls of weak, delicate fibre, the perineal body will, without other assignable cause, be found to be totally worthless and entirely incapable of performing its functions. Such cases are not commonly met with, but they do unquestionably exist, and every practitioner of large experience must have met with them. In such cases the virgin vagina presents to the finger the characteristics of that which has given birth to children, and not only vaginal walls but perineum are extraordinarily relaxed.

Either in the virgin, the nulliparous married woman, or the multipara the uterus, from increase of its own weight or from suddenly applied pressure from above, may become suddenly or gradually completely prolapsed. When such prolapse occurs and the uterus for a long time remains between the labia, the perineal body, by over-distension, loses its power, and after restoration of the uterus to its place remains permanently enfeebled. This condition is likewise produced by inversion, the presence of a large fibrous polypus, or the wearing of large globular pessaries.

As utero-gestation advances, not only does the uterus grow with the growth of the fœtus: the vagina, uterine ligaments, perineum, and mammæ likewise undergo a physiological hypertrophy, which continues till delivery. After this has taken place, that retrograde metamorphosis styled involution may fail in any or all of these parts, which then remain large, lax, and wanting in contractile power. This failure may affect the perineum, in consequence of a laceration more or less profound and the absorption of septic material subsequently. Or it may occur, as subinvolution of other parts often does, without assignable cause. We are not aware that this condition attracted any notice, as connected with the perineum, until attention was called to it in this work some years ago. As to its existence there can be no doubt, and it certainly produces evil results which are scarcely less striking than those resulting from laceration. The difficulty of accounting for complete loss of power, as evidenced by extreme relaxation of the perineum, will be recognized in the literature of this subject by an attempt to explain the condition by supposing that in such cases the perineal body has been sundered from above, without any laceration having been inflicted either upon its mucous or cutaneous surface.

Subinvolution often affects vagina and perineum simultaneously, and although the latter appears to be normal in size and uninjured by the parturient process, it is found loose, atonic, and feeble. The anterior vaginal wall and bladder sag downward for want of support, and the posterior vaginal wall and rectum protrude over the ineffectual perineal barrier. Instances of this pathological condition are very common, and uterine displacement as a result of it will be frequently seen.

Cases of complete uterine prolapse in very old women, in whom both uterus and vagina have long undergone senile atrophy, are not by any means rare. Here the uterus does not descend primarily, but an absorption of the adipose tissue, which is stored away around the vagina and serves as a support for it, occurs as the decadence of advancing age shows itself, and a perineum hitherto strong becomes inefficient and inactive.

Rupture of the perineum may simply be described as a splitting of the perineal body. Laceration in the first degree splits the triangle, one side of which is covered by the vagina, only for a short distance; one in the second degree splits it to its centre; while those in the third and fourth divide the triangle entirely through, and at once remove the "keystone" from its place in the arch.

Destruction of the power and function of the perineal body, more frequently than anything else, includes anterior and posterior displacements of the uterus and prolapsus in its three degrees. Removal of the perineum does not take away support from the uterus, but it alters the shape and removes the supports of the vagina, and causes it to drag upon and displace the uterus as a direct tractor.

A curious phenomenon, which occurs in about one out of a hundred cases of destruction of the power of the perineal body, while in itself not important, serves to show how markedly the relations of the pelvic organs are in this way impaired. We allude to entrance of air into the vagina. While the pelvic organs are in normal condition the close apposition of the vaginal walls, already alluded to, entirely excludes the spontaneous entrance of air, and at once expels it if forced in. Let the perineal body be entirely destroyed, however, and certain positions assumed by the woman draw air into the canal, which subsequently escapes with a disagreeably explosive sound. This occurrence has been described[1] under the names of garrulitas vulvæ or flatus vaginalis, and deserves some attention, in view of the fact that it alarms patients, who are at a loss to account for it, and mortifies them by its happening at untoward times.

So intimately are gynecology and obstetrics connected in reference to this subject that a few words upon its relations to the latter will not be inappropriate. It is no exaggeration to say that a very large proportion of female diseases take their origin in the mismanagement of the lying-in chamber. If this be so—and no gynecologist will deny it—to the obstetrician the importance of the perineum in this connection cannot be exaggerated. Its rupture furnishes one of the most fruitful sources for the absorption of septic elements, and we do not hesitate to say that thousands of women suffer throughout their lives from uterine displacements, engorgements, and vesical and rectal prolapse in consequence of injuries inflicted upon it during the parturient act. To an imperfect comprehension of the anatomy and functions of the perineum we attribute, in great degree, the impression entertained by many practitioners that, in spite of all that is said, its rupture, so long as it does not involve the anal sphincter, is a matter of little moment. This dangerous dogma—which, in our minds, renders him who entertains it an unfit person to be entrusted with the grave responsibilities of the lying-in chamber—is always based upon the fact that such a practitioner has seen many perinea ruptured during labor, even without interference on his part, and has, to use the common phrase, "heard nothing of them afterward." But such a loose method of drawing deductions is hazardous as well as unphilosophical. How do they who draw them know how many cases of uterine displacement or vesical and rectal prolapse, treated by themselves or others, have been the remote consequences of perineal lacerations regarded at the time of their occurrence as of no importance? To account for remote troubles occurring years afterward is equally simple in his philosophy, for has not the patient lifted heavy weights, or fallen, or does not the displaced and congested uterus present sufficient signs of "chronic metritis" to offer this as a scapegoat?

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[1] See an essay by Löhlein, *Zeitschrift für Geburtshülfe und Gynäkologie*, vol. v. No. 1.

Let us suppose that the perineum has been torn during labor down to the sphincter ani muscle. In this accident the vagina is always torn, though the grave consequences attending that accident when occurring in the upper half of the canal are here prevented by the intervention of the triangle of dense elastic tissue which exists between the vagina and the rectum. An immediate consequence is the exposure of an extensive raw surface indisposed to heal by first intention, richly supplied with blood- and lymph-vessels, and quite near to chains of lymphatic glands, intrapelvic and inguinal. Over this surface the flow of an ichorous, fetid, and semi-putrid animal fluid must, in spite of the greatest precautions, steadily pass for from two to three weeks—a fluid consisting of decaying and flaking decidua, disorganized blood, and quantities of muco-pus. The wonder is, not that septicæmia occurs so often under these circumstances, but that so many cases escape it where everything seems so perfectly arranged to favor it. Let one imagine a wound an inch deep and an inch and a half long made in the thigh near the groin or on the arm near the axilla, and bathed every hour of the day with the lochial discharges of a parturient woman! Would he regard the occurrence of lymphangitis, phlebitis, and erysipelas as being unlikely consequences? And yet this is what occurs to every lacerated perineum, the wound thus treated being in no manner protected against the evils incident to such exposure.

If cases of decided laceration of the perineum were closely followed up from the lying-in room to the end of life, and all the evils which immediately and remotely arise from this accident intelligently noted, the list would be a long one—all not, of course, showing themselves in every case, but some occurring to one woman and some to another. It may be thus presented:

Septicæmia;
Anterior and posterior uterine displacement;
Prolapsus;
Cystocele;
Rectocele;
Uterine engorgement and hyperplasia;
Subinvolution of uterus and vagina;
Destruction of power of uterine ligaments;
Development of a tendency to abortion;
Impairment of sexual gratification to the male;
Neuralgia affecting the site of rupture.

Presented thus, this array may appear unnecessarily formidable, but there is not one pathological condition mentioned the occurrence of which practical men will feel inclined to question as a consequence of puerperal laceration of the perineal body.

A decided laceration having occurred, if the obstetrician be a man who has familiarized himself with the anatomy and physiology of the perineum, it is difficult to understand how he can doubt the propriety of early closure of the wound, both as immediately preventive of septicæmia—for for forty-eight hours, during which the healing process seals together the freshly-cut surfaces, the uterine discharges are innocuous—and as remotely preventive of all the evils which have just been enumerated. Should the operation prove a success, the gain to the patient will be great; if it prove a failure, no evil will have been done.

That there are sources of failure for immediate operation inherent to the condition itself cannot be denied; but equally fruitful sources for it are to be found in ignorance of the anatomy of the part to be repaired, the performance of the operation hurriedly and without system, and the fact that the obstetrician has cultivated no capacity for surgery.

This question may here be very pertinently asked, If in the non-puerperal state the perineum should be severed completely down to the sphincter ani muscle, would prolapse of vaginal, rectal, and vesical walls necessarily occur? No, not necessarily, though in time probably. On three occasions we have done this for the delivery from the vagina of very large tumors, and to test the question we have delayed closure of the perineum. In no case did prolapse occur. And why did it not do so when it so commonly ensues upon rupture of the perineum in labor? Because laceration of the perineum during labor or abortion is very commonly the cause of subinvolution of vagina and perineal body. The former remains a large, lax, uncontracting bag; the latter, a yielding, unresisting mass of adipose tissue and skin.

Even after labor prolapse of these parts does not always ensue upon rupture, even though the sphincter ani and posterior vaginal wall for some distance up the rectum be involved. In spite of the accident, involution goes on, the strength of the vaginal walls is recovered, and they are sustained, although their shape and direction are altered and they lack the support of the perineal body. But such an occurrence as this is the exception, and not the rule, and in spite of many such the rule stands unquestionable.

CHAPTER XI.

PROLAPSE OF VAGINA, BLADDER, RECTUM, AND INTESTINES.

Prolapse of the Vagina.

THE remarks made in the preceding chapter being distinctly borne in mind, it will be easy for the student to get a comprehensive idea of prolapse of the pelvic viscera as a consequence of disability on the part of the perineum, and the subject may be dealt with much more cursorily than it could have been without them.

It might upon very valid grounds be maintained that prolapse of the vagina or rectum and bladder are so intimately connected with prolapsus uteri that this chapter should have been united with that upon the latter condition. We have especially avoided this course, for the reason that we wish to direct the reader's attention particularly to prolapse of the vagina as a primary condition—one often long existing without uterine descent, and very frequently preceding that state as a causative influence. For any repetition which may occur in the two chapters we offer no apology, in view of the great importance of both subjects.

Definition and Synonyms.—The mechanism by which the pelvic organs of the female are kept in their proper positions and relations to each other offers, in its simplicity and perfection, an excellent example of that adaptation of means to an end which is so often repeated in the animal economy. The uterus is so sustained that when necessity requires it, not only in pregnancy, but under a number of other circumstances, it may rise or fall or tilt backward or forward, while the rectum, bladder, and lowest layer of small intestines are kept in place and allowed to distend and empty themselves without material change of relation.

When the tone of the walls of the vagina is impaired, and they pouch into its own canal so as to fall downward toward the vulva, the condition is called prolapsus.

It is an important question whether there can be prolapse of the vagina without rectocele, cystocele, or uterine prolapse. The anterior or upper wall of the vagina is closely bound to the base of the bladder and the front of the cervix uteri, and by means of the utero-sacral ligaments it is indirectly attached to the sacrum. This wall aids in support of the uterus, bladder, and small intestines. The posterior wall is not so firmly bound to the rectum, though the adhesion at the extremity of the utero-rectal pouch of peritoneum is quite strong. At the perineal septum, a point a short distance above the vulva and just at the upper edge of the perineal body, the muscular walls of the vagina pass off to attach themselves to the ischio-pubic rami. At that point the canal is constricted by the pubo-coccygeus, the true sphincter vaginæ muscle. The mucous membrane of the canal passes down to the fourchette. These anatomical arrangements account for the fact that prolapse of the vagina without simultaneous displacement of one or more of its surrounding viscera is exceedingly rare, and that when it does occur as a distinct disease it is very generally found to affect only the posterior wall. We have met with no case in which the anterior wall has decidedly prolapsed without coincident descent of the bladder, but we have seen a few instances of prolapse of the posterior wall without alteration of the position of the rectum. Subinvolution, or redundancy of the posterior vaginal wall is very liable to simulate true rectocele.

Pathology.—Any influence which impairs the natural tonicity and strength of the vaginal canal, rendering it abnormally voluminous and lax, which alters its natural shape and the incurvation of its walls, or which destroys its lower buttress or support, will tend to induce this affection. As pregnancy and parturition combine most, and often all, of these, they very generally furnish both predisposing and exciting causes. The development of the vagina, and increased weight of the uterus dependent upon the former, and the distension of the canal and enfeebling of the sphincter muscle incident to the latter, all unite in favoring prolapsus. As the fibre-cells which constitute the nascent state of the uterine muscular fibres develop, so as to make of the insignificant non-pregnant uterus the powerful organ which expels the child at full term, so do those of the vagina, the Fallopian tubes, and the uterine ligaments. By the process of involution, which diminishes the size and weight of the uterus, these parts likewise return to their original dimensions. Those influences which arrest this important process in the uterus, resulting in subinvolution, likewise affect it in the other parts mentioned and render them atonic and feeble.

Prolapsus vaginæ is very rare, except in those who have borne children, although it may occur. Sir Astley Cooper met with it in a girl aged seventeen who was admitted into Guy's Hospital for supposed prolapsus uteri, and Prof. Meigs[1] mentions that Dr. Mutter of Philadelphia saw it occur in a child six months old in consequence of convulsions; and we have seen several instances in young virginal subjects of forcible prolapse of the whole uterus and vagina, produced by a sudden powerful pressure from above, such as lifting a heavy weight or violent straining at stool.

Causes.—From what has just been said the following causes will naturally suggest themselves as those most likely to produce this displacement:

Violent efforts of the abdominal muscles;
Repeated parturition;
Senile atrophy of vaginal walls;
Rupture of perineum;
Previous distension by tumors;
Subinvolution of the vagina and perineum.

Of all these causes, the last is the most frequent, more especially when it accompanies, as it often does, partial rupture of the perineum. Next in frequency stand senile atrophy and absorption of surrounding adipose tissue.

It is evident that all act either by debilitating the power of the vaginal walls by mere mechanical distension, by specifically robbing them of their tonicity, or by removing the buttress against which the canal rests at the vulva.

Varieties.—The displacement may be of two forms, acute and chronic. The power of the canal may be overcome by a violent effort, a fit of coughing, uterine or abdominal contractions, or similar acts which with great suddenness force the contents of the abdomen down upon the pelvic viscera. This occurrence, which is very rare, is generally accompanied by sudden descent of the uterus or occurs soon after parturition. The ordinary form of the affection is that in which by the slow and steady action of one or more of the causes enumerated the resistance of the vagina is gradually overcome, and little by little a fold is forced downward toward and through the vulva. The first variety is the result of a few minutes' efforts; the second, that of months or even years of morbid action. Prolapse of one wall—partial prolapse, as it has been styled—is often lost sight of in view of the hernia of the bladder, rectum, or small intestines which accompanies it. Hence cystocele, rectocele, and enterocele may be regarded as complications of the affection.

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[1] Meigs's translation of Colombat.

Course, Duration, and Treatment.—A sudden attack of prolapse, being overcome by proper means and the patient kept quiet, may disappear and not return, but in that variety which occurs gradually there is no limit to the duration of the disease. Generally, the physician is not called until it has existed for a long time and become chronic. The most important results of the condition are prolapse of the uterus, bladder, and rectum, one or more of which are almost sure to ensue.

Prognosis.—The prognosis as to cure will depend upon the degree and duration of the malady. It is always, whatever be its extent, susceptible of considerable relief by surgical means, but generally proves incurable by those of medical character.

Symptoms.—Should displacement of the vagina exist alone—that is, without creating hernia of surrounding organs—the patient will complain of a sense of discomfort in the vagina, with a tendency to bearing down as if to expel some foreign body; a feeling of heat, fulness, and throbbing of the vulva; a certain amount of pelvic uneasiness in walking or making any muscular effort; and a tendency to become fatigued if the condition be one of aggravated character. Physical exploration will reveal the presence of a tumor between the labia, which touch will demonstrate to contain no liquid, and yet not to be solid in its nature. Sometimes the mucous membrane covering it is excoriated, ulcerated, and purple in color; at other times it will be smooth, shining, tough, and covered by pavement epithelium. A simple vaginal prolapse of any extent is, as has been stated, quite rare. When it does occur it generally affects the posterior wall, but prolapse accompanied by hernia is more commonly found to affect the anterior wall, cystocele existing. Should the case be complicated by vesical or rectal prolapse, the symptoms just enumerated will present themselves, with the addition of others dependent upon disturbance of the functions of the part which forms the hernia. In one case the prominent symptoms will point to the bladder; in another to the rectum; and in very rare instances to the small intestines.

As the treatment of prolapsus vaginæ is, with slight modifications, the same for uncomplicated and complicated cases, it will be considered after the subject of the vaginal herniæ has been discussed.

Cystocele, or Prolapse of the Bladder.

Cystocele, or vesico-vaginal hernia, consists of descent of the bladder toward the vulva, so as to impinge upon the vaginal canal (Figs. 62 and 63). When the anterior wall of the vagina, which is closely adherent to the bladder, the base of which it in part sustains, ceases to afford the required assistance, the bladder, partly under this influence and partly under that of traction, descends and forms a small pouch in the vagina. This is at first very small, but gradually it increases, until at last it forms a decided tumor, which protrudes between the labia majora. The pouch thus created becomes filled with urine, which in the ordinary act of micturition cannot be evacuated, from its being contained in a species of diverticulum. This undergoes decomposition, free ammonia is formed, and cystitis or vesical catarrh is established, which annoys the patient by pain, heat, vesical tenesmus, and scalding in urination. Should any doubt exist as to the character of the tumor felt in the vagina, a curved sound or catheter may be passed into it through the urethra for the settlement of the question.

It is an interesting question whether cystocele is ever the cause instead of the result of prolapse of the vagina. It is probable that it may be so in very rare cases, though such a connection between the two affections must be uncommon, since the former generally occurs in women who have borne children, and thus been exposed to influences which tend to diminish vaginal resistance. Scanzoni[1] is convinced that the vesical prolapse is sometimes primary, and due to irregular spasmodic contraction of the fibres of the body of the bladder while the neck remains firm. This forces the urine to the fundus, which dilates and undergoes displacement.

A more correct designation of this condition would be cystocele and anterior colpocele, since both the bladder and the anterior vaginal wall are prolapsed.

Rectocele, or Prolapse of the Rectum

Rectocele, or recto-vaginal hernia (Figs. 60 and 61), occurs in a manner similar to that by which the bladder descends. The posterior wall of the vagina not only ceasing to give proper support to the anterior wall of the rectum, but dragging it obliquely downward, this forms a pouch which soon fills with fecal matter. The feces, becoming hard, and, in consequence, irritating, create mucous inflammation and discharge, with tenesmus, obstinate constipation, and hemorrhoids. The tumor thus formed will sometimes equal in size a man's fist, and, protruding over the perineum, give some difficulty in diagnosis from its size and solidity. This difficulty will at once disappear upon rectal exploration and use of an enema of ox-gall and warm water.

[In one instance I saw a patient confined to bed for three or four months from one of these sacculated accumulations of feces, under the supposition that cellulitis existed which by effused lymph had completely blocked up the pelvis. It may be supposed that such an error will rarely be met with, yet the case which I have just mentioned occurred to a practitioner of great experience and ability.—T. G. T.]

As a rule, rectocele is annoying chiefly by the sensations of weight and dragging, and by the protrusion of the vaginal wall between the labia, whereby irritation from friction may take place and the vagina is kept exposed to outside influences. Sterility is very apt to result as a consequence of the non-retention of the semen.

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[1] *Op. cit.*, p. 497.

Enterocele, or Prolapse of the Intestines.

Enterocele, or entero-vaginal hernia, consists in descent of a portion of the small intestines into the pelvis, so as to encroach upon the vaginal canal. Such a descent usually occurs in this manner: As a rule, no intestines are found in Douglas's pouch; when they descend there, it is usually in consequence of a forward or downward displacement of the uterus, or some accidental motion of the patient by which the pouch is caused to gape. A loop of intestine which happens to be at the bottom of Douglas's pouch gradually stretches this serous prolongation, and, advancing between the rectum and vagina, pushes the posterior wall of the latter before it, so as to form a tumor at the vulva. In a similar manner it is stated that the intestine may advance between the bladder and uterus and depress the anterior vaginal wall, but this must be rare, as authors of extensive experience assert that they have never met with it.

Enterocele is not an accident likely to produce evil results unless it occur during labor, when strangulation may take place. Even at this time such a complication is very rare, for the free passage afforded the displaced intestine back to the abdomen will almost always preclude this difficulty. Dr. Meigs[1] relates a case occurring during labor in which the progress of the parturient process was checked by a large mass of intestines until he succeeded in reducing the hernia. He says, with reason, that in such a case strangulation or contusion was to have been feared.

One very momentous aspect in which these herniæ must be viewed is in relation to puncture of vaginal tumors, occurring during labor, for ascertaining their contents. No such explorative means should be resorted to without careful differentiation of vaginal herniæ of all descriptions, and especially of that of which we have last spoken. The peculiar sensation to the touch of a tumor filled with air, a resonant sound upon percussion, the detection of peristaltic movements, and careful exclusion of all other forms of tumor which might appear under the circumstances, will serve to avoid error. When it is borne in mind that vaginal tumors are very near the inflated intestines, and that they often yield to the touch an airy sensation, it will be appreciated that great caution is necessary in arriving at a diagnosis. Even when the investigator feels positive in his diagnosis, it is always advisable to test the question by capillary puncture and aspiration. Should an intestine be punctured by the little needle employed, no evil will result.

The following case illustrates the dangers and possibilities of erroneous diagnosis in these cases:[2]

A widow æt. fifty-two, mother of twelve children, the last born twelve years ago. A year since she suffered from prolapsus uteri, which was replaced. Patient presents, on examination, a swelling about three inches long, reddish-blue in color, protruding between the labia majora, covered with granulations and pus. *Diagnosis*—Polypus of the uterus; operation for removal. After suffering severe pain in the abdominal regions for several hours, death ensued. *Autopsy*—In the pelvis was found a half pound of liquid blood. Uterus and ovaries atrophied. A portion of the great omentum and a piece of the transverse colon were carried away with the mass. In the posterior wall of the vagina was an opening about 5 cm. in diameter. 24 cm. of omentum and 10 cm. of the colon were excised.

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[1] Notes to Colombat on *Diseases of Women*, p. 211.

[2] *Centralblatt für Chir.*, May 3, 1879, p. 303; *Hosp. Gazette.*

Treatment of Vaginal Prolapse and Herniæ.—Should the accident have occurred suddenly, reduction should at once be accomplished, and the recurrence of the displacement prevented by appropriate means. The bladder and rectum being evacuated, the patient should be placed in the knee-chest position, and, the fingers being well oiled, steady pressure should be exerted in coincidence with the axis of the inferior strait until the prolapsed part is returned to its place. In the case of enterocele already referred to as treated by Prof. Meigs the patient was placed upon the left side, and, taxis being practised, the mass suddenly slipped above the superior strait, into which the next uterine contraction forced the child's head. To prevent a relapse the pelvis should be elevated, the patient kept perfectly quiet, tenesmus, if present, relieved by the use of opium, and the vagina constricted by astringent injections.

But sudden cases of vaginal prolapse and hernia are very rarely met with. It is usually those which have slowly and gradually established themselves that we are called upon to treat, and these are always obstinate and rebellious. The means at our command for overcoming such cases are the following:

1st. Local astringents and tonics;
2d. Development of retentive power of the abdomen;
3d. Supplementary support;
4th. Surgical procedures.

The first of these may be effectual in slight cases, but in those of graver character they will prove insufficient. The tone and strength of the vagina may be temporarily restored by the use of injections of large amounts of water medicated with tannin, alum, or zinc, employed night and morning. The patient should be sent during the summer to a watering-place, where sea-bathing and injections of sea-water into the vagina may be employed. A very excellent result will also sometimes follow the use of vaginal suppositories containing one of the astringents mentioned.

The systematic and persistent insertion every day or two of tampons composed of cotton or wool covered with powdered tannin and iodoform, equal parts, so as to produce and maintain a constant contraction of the vaginal canal, will in recent cases often restore the tone of the walls of that organ and effect a complete and permanent cure of the displacement. In old cases, however, no permanent benefit can be expected from such treatment.

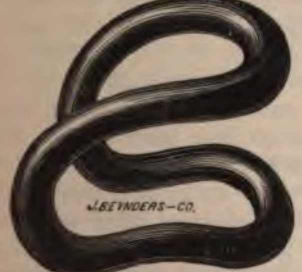
Too much stress cannot be laid upon the influence of the abdomen in sustaining the pelvic viscera. An impairment of its force by want of exercise and the pernicious habit of disabling the power and impeding the function of the diaphragm and chest-muscles by tight lacing and the wearing of heavy clothing is one great cause of their displacement. Improvement in this respect, by removal of the depreciating influences mentioned and recovery of lost power by appropriate exercises, is a matter of great moment. But this will be left for consideration under the head of Uterine Displacements.

Supplementary Support.—In stout women an abdominal bandage with perineal pad by relieving pressure from above may accomplish a great deal of good when combined with complete removal of all constriction and weight of clothing about the waist. In thin women it accomplishes nothing.

The vaginal pessary, an instrument of decided value in all the displacements of the uterus, does little or no good here. In many cases no pessary which rests upon the walls of the vagina can be retained within the distended canal; in others none can be found capable of resisting the downward pressure; while in all increase of dilatation and atony is effected by them. It is true that for a time apparent good results from them, but the hope to which this gives rise is very generally delusive, and very soon they must be abandoned. The function of a vaginal pessary is to support the uterus, not to sustain the vagina. In some cases an exception will be found to this rule in Cutter's cup pessary or some similar instrument supported by an external attachment. Here sufficient power is afforded for support of the uterus at a high point in the pelvis, which mechanically puts the lax vagina on the stretch and prevents its prolapse, together with that of the bladder and rectum. This instrument will be shown in connection with prolapsus uteri.

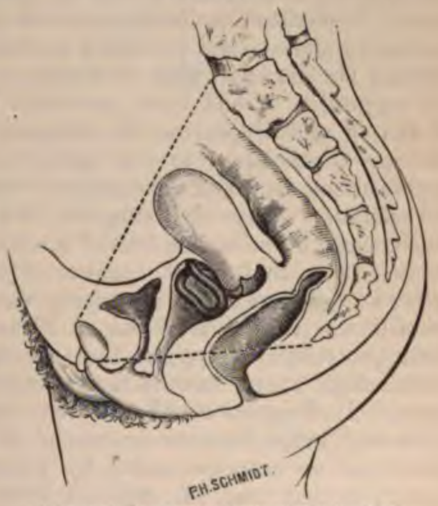
An exception to this statement must be made in favor of a very ingenious instrument devised some years ago by Dr. E. C. Gehrung of St. Louis, which is shown in the accompanying cuts (Figs. 64 and 65). It is used in cystocele, and, in our experience, is the only vaginal supporter which will effectually and comfortably keep up the prolapsed anterior vaginal wall. The method of its application is very simple. It rests upon the posterior vaginal wall and pelvic floor, and

FIG. 64.



Gehrung's Pessary for Cystocele.

FIG. 65.



Gehrung's Pessary for Cystocele in Position (diagrammatic).

is placed between the symphysis pubis in front and the cervix uteri behind. While it does not *cure* cystocele, it gives so much comfort to the patients that they continue wearing it for years, and have no desire for a radical cure by operation.

Surgical Procedures.—Of these there are three which may prove effectual. If a ruptured perineum seems to produce the want of support, the operation of perineorrhaphy may be all that will be necessary. This is described in the next chapter. Should this not be sufficient, colporrhaphy should be performed upon the anterior or posterior vaginal wall, as one or the other seems most at fault; and, should even this not relieve the condition, the remaining wall should be likewise diminished in extent by the same procedure.

Almost all, except the most aggravated cases, which are accompanied by great hypertrophy in the vaginal walls, will yield to these three procedures, alone or combined.

Colporrhaphy or Elytrorrhaphy.[1]—The idea of constricting the vagina so as to diminish its calibre, and by this to remove the traction exerted by its fall upon rectum, bladder, and uterus, long ago suggested itself to the minds of surgeons. In 1823, M. Romain Gérardin made the suggestion before the Medical Society of Metz, but the operation does not appear to have been essayed, for the writer with a great deal of patriotic zeal states, in a subsequent essay upon the subject,[2] that "his desire had been to put beyond controversy the origin of the operation, and to preserve for French surgery the priority of its conception if not of its execution." While this surgeon was felicitating his country upon the conception of an idea, Dieffenbach in Germany and Heming in England proved its practicability by absolute performance. Dieffenbach probably operated as early as 1830, as a report of his having done so was published in June, 1831. In November, 1831, the late Dr. Marshall Hall of England published a case in which, at his suggestion, it had been performed by Dr. Heming, the translator of Boivin and Dugès on the *Diseases of the Uterus*, with complete success. Subsequent to this period it was performed, with various modifications, by Fricke, Scanzoni, Velpeau, Roux, Stoltz, and others, the operation always consisting in "the removal of a band of vaginal mucous membrane and union of the two lips of the wound in such a manner as to diminish the calibre of the vagina. . . . . Dieffenbach refers to a great number of women who were completely cured by the procedure. . . . . Fricke out of 4 cases cured 3."[3] Judging from these quotations, it appears that the operation has been known and practised for a long time on the continent of Europe, especially in Germany. In England it had not been resorted to up to the year 1865, if we may judge from the statement of Dr. Sims[4] that, after a discussion upon an essay presented by himself to the London Obstetrical Society in that year, Mr. Spencer Wells called attention to the operation of Mr. Heming, already referred to, with the assertion that "at least one case had been successfully operated upon."

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[1] Κολπος or *ελυτρον*, "the vagina," and *ραφη*, "suture."

[2] *Gazette médicale*, 1835, p. 558.

[3] Wieland and Dubrisay, *op. cit.*, p. 533.

[4] *Uterine Surgery*, Eng. ed., p. 319.

The operation, probably for reasons which we shall mention hereafter, had fallen entirely into disuse when Dr. Sims[1] revived it in 1858, with certain modifications. His operation, which we shall soon describe, differs very essentially from that adopted by his predecessors, and should in justice be regarded as the parent of the numerous, we had almost said innumerable, modifications of it which have since appeared.

It is a mischievous error to describe this operation as one performed for prolapsus uteri. That that displacement is one of the complications often existing as a consequence of prolapse of the vagina is true, but the operation is often necessary when vagina, bladder, and rectum alone are seriously involved. The traction exerted by the descent of these viscera is frequently the cause of uterine displacements of various kinds, and that being removed by the operation the consequent displacement disappears. But the student must remember that colporrhaphy is the legitimate surgical resource for loss of power and displacement of the vagina. To take a different view is to obscure the subject, and to substitute a purely empirical for a scientific and rational arrangement.

This error is based upon the belief that the vagina is a uterine support, and that its prolapse *allows* of descent of the pelvic viscera, not that it drags them down by its own inherent tractile power. Some writers describe two operations for narrowing the vagina—one for the cure of prolapsus uteri, and another—both being for anterior elytrorrhapy—for prolapsus vesicæ! This is surely a useless and mistaken technicality. Whatever supports vagina, bladder, or rectum takes away direct traction from the *uterus*, and *allows* other influences, the retentive power of the abdomen chief among them, to keep the uterus in position. Carl Schroeder[2] strikes the true key-note of this subject when he declares that "the only circumstances under which we may expect a satisfactory result from this operation are when the vaginal prolapse was the primary one."

Sims's Operation of Colporrhaphy.—The patient, being put under the influence of an anæsthetic, is laid upon a table upon the left side, as for an ordinary speculum examination, and Sims's largest speculum introduced. A curved sound with forked tenaculum points is fixed in the cervix uteri and made to cause a fold in the anterior vaginal wall, as shown in Fig. 66.

The parts being steadied by this instrument, the operator by means of two tenacula folds over the opposite walls of the vagina so as to decide where union is to be effected. Having settled this point, the mucous membrane is hooked up by a tenaculum several lines above the meatus and cut by curved scissors. The tenaculum lifting the piece thus cut, and when necessary being again attached to the mucous membrane, the incision is carried upward, so as to cut out a strip extending to one side of the cervix. Then another furrow is cut in the same manner on the other side.

The sound being removed and the cervix pulled down by a small tenaculum, the two transverse lines of denudation, shown in Fig. 67, nearly uniting the two arms of the V, are made.

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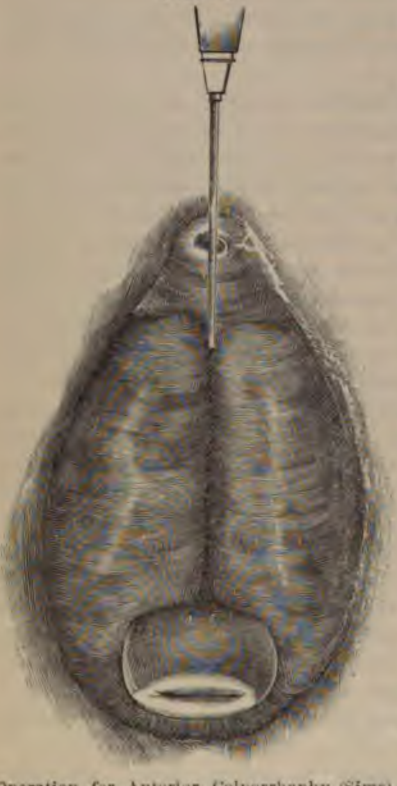
[1] *Uterine Surgery*, p. 308.

[2] *Dis. of Female Sexual Organs*, Am. ed., p. 208.

Sutures of silk are then inserted after the plan employed in vaginal fistulæ, and by them silver sutures are drawn into position. The passage of sutures should be commenced at the apex of the triangle and continued upward.

FIG. 66.



Operation for Anterior Colporrhaphy (Sims).

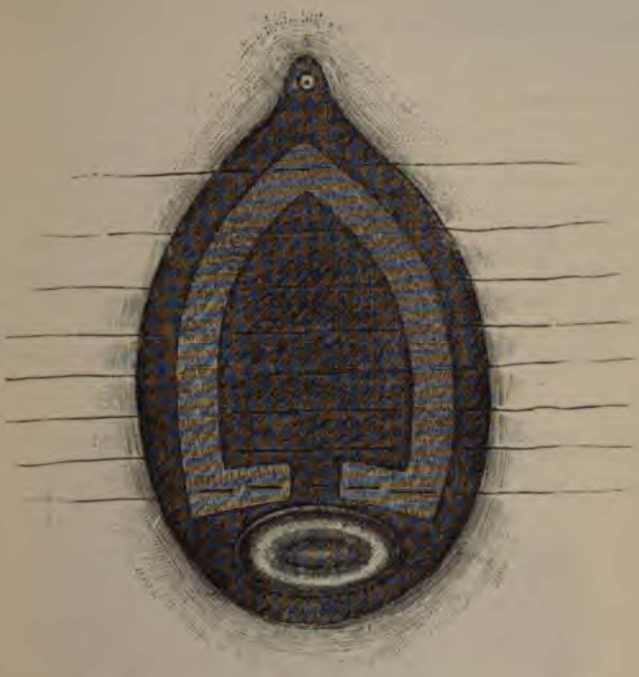
The after-treatment consists in perfect quietude in the horizontal posture, frequent removal of urine by a catheter, and the production of constipation by the use of opium. The lower sutures may be removed in ten days, and the upper in a fortnight. The patient should be kept in the recumbent posture for two or three weeks, and cautioned against immoderate muscular effort for some time afterward.

Dr. Emmet, finding that the pouch left posterior to the uterine neck by this procedure was sometimes entered by the cervix, improved the operation by extending the transverse denudations so as to make them meet. He has since the introduction of this procedure still further simplified it, in the following manner: At the commencement he catches up with a tenaculum a patch of mucous membrane at the proper distance to one side of the cervix, and snips this out with scissors. On the other side he does the same thing, and also on the posterior wall of the cervix. He then passes a wire suture so as to bring all these denuded points together, face to face, and twists the wire so as to fix them. The result is that the folding of the vagina accomplished by the sound, as shown in Fig. 66, occurs without the use of that instrument. Catching up a piece of mucous membrane on the vaginal fold of each side with the tenaculum, he now cuts it out, and at once passes a suture, and thus he proceeds, step by step, avoiding a great flow of blood, and opposing the abraded surfaces immediately, accurately, and without danger of passing the sutures so that they will not be symmetrical.

As we have already mentioned, there are numerous modifications of this operation, but we shall mention only two more—one for elytrorrhaphy upon the posterior wall, or posterior elytrorrhaphy; the other for the anterior operation.

The peculiarly-shaped triangle of Sims is by no means necessary for this operation. Any figure which results in constriction of the vaginal wall will remove traction from the uterus and keep the vagina from pro-

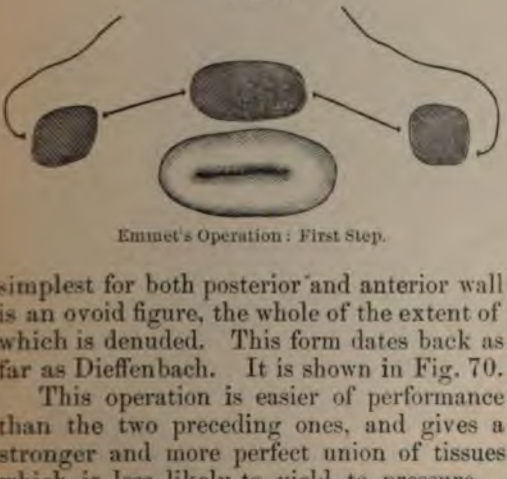
FIG. 67.



Sims's Operation: Shape of Denudation on Anterior Vaginal Wall.

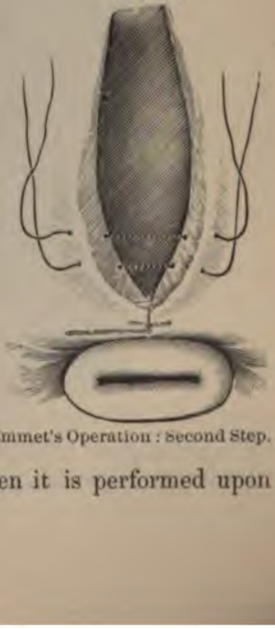
lapsing. Thus, Hegar turns the apex of the triangle up and the base down, while others resort to variously-shaped denudations. One of the simplest for both posterior and anterior wall is an ovoid figure, the whole of the extent of which is denuded. This form dates back as far as Dieffenbach. It is shown in Fig. 70.

FIG. 68.



Emmet's Operation: First Step.

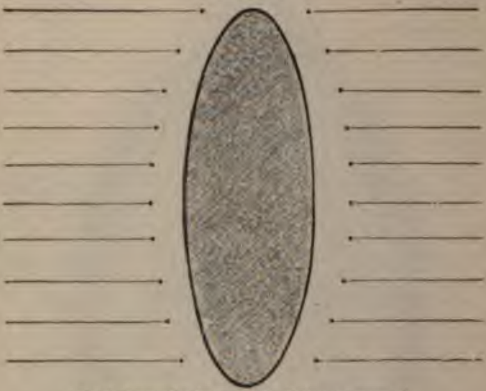
FIG. 69.



Emmet's Operation: Second Step.

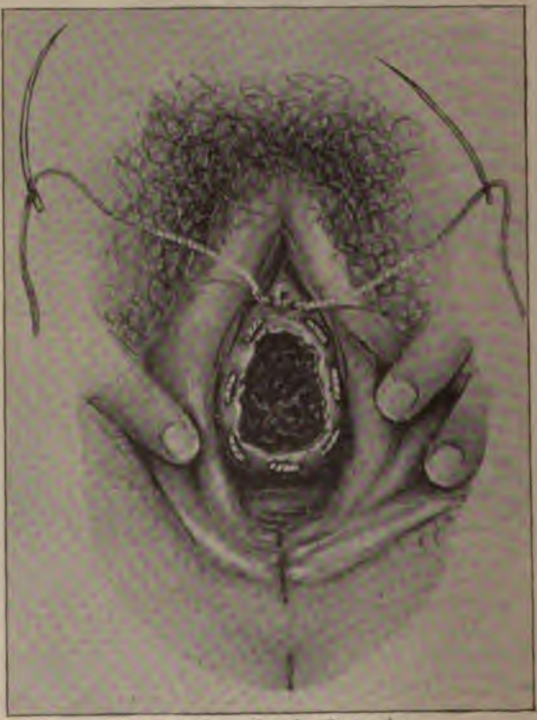
This operation is easier of performance than the two preceding ones, and gives a stronger and more perfect union of tissues which is less likely to yield to pressure. When it is performed upon the anterior wall the patient should lie as in Sims's operation just described; when upon the posterior wall, upon the back, the thighs flexed upon the abdomen, and the lateral walls of the vagina retracted by right-angled retractors held by assistants. Simon's operation of "posterior colporrhaphy" is only a modification of this.

FIG. 70.



Oval Denudation, with Sutures passed.

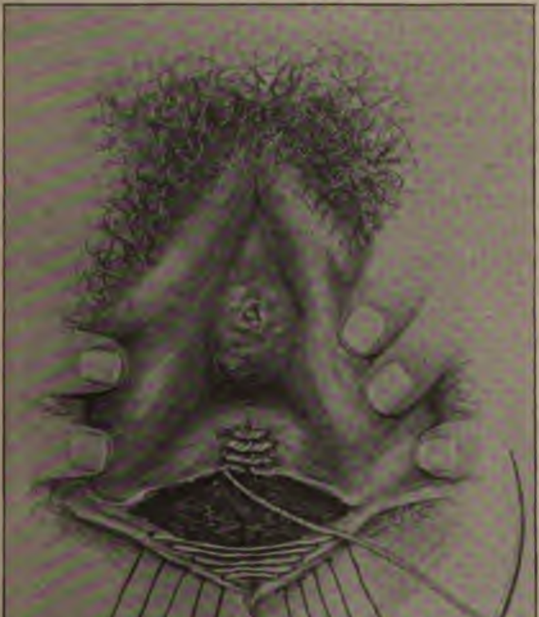
FIG. 71.



Stoltz's Operation for Cystocele.

are two operations for narrowing the anterior and posterior walls which we have practised for several years with almost le success. That on the anterior vaginal wall first came to our a French journal, where it was ascribed to Prof. Stoltz of It consists in making a circular denudation embracing the rtion of the prolapsed vaginal wall, and then passing a thick re, with a needle at either end, just outside of the edge of the beginning at the point nearest the cervix and emerging on le just below the meatus urinarius. The stitch is not entirely ut is made to emerge and enter again at short intervals; the portion, being thoroughly cleansed and rendered aseptic, is pward toward the bladder with the sound. The two sutures ed and securely tied. The denuded portion of the anterior vall is thus pushed up into the bladder, and that portion of the constricted to the extent of the size of the denudation.

FIG. 72.



Hegar's Operation, foreshortened.

great advantage of this operation is that if at the same time rior vaginal wall and perineum are operated upon, this single be removed without disturbing the other parts, by simply cutting the loop just below the meatus. We have found this circular cicatrix to be far more lasting and less likely to separate than the longitudinal cicatrices following the operations already described.

The operation on the posterior vaginal wall—that is, for rectocele with or without prolapsus uteri—is the one which is described by Hegar as original with himself. It consists in denuding a triangular strip on the posterior vaginal wall, the apex of the triangle being situated at the highest point of the rectocele, and usually within an inch of the cervix uteri, the two other angles at a point on each labium corresponding in height to the spot where it is desired to form the new posterior commissure. When all this space has been denuded the stitches are inserted, beginning at the upper angle. Hegar uses interrupted silver wire, but we have found a continuous catgut suture preferable, each stitch being tightened by underlooping the thread until the vaginal orifice is reached, when several deep sutures of silkworm gut are passed from the skin through the newly-formed perineum and tied outside. These last sutures act as stay sutures, and bring together firmly the sundered perineal muscles. Of course only these last sutures have to be removed, the catgut being absorbed. By this operation not only is the vagina narrowed, but the perineum is also restored to any height which the operator may desire.

As a rule, it is desirable to restore the perineum in addition to and after narrowing the anterior vaginal wall, even though the former may not be very much injured. An ingenious operation for prolapsus uteri has been described by Léon Lefort of France, which consists of freshening the anterior and posterior surfaces of the prolapsed vagina, each in two longitudinal strips, and then uniting the corresponding anterior and posterior strips on each side, gradually replacing the uterus as the sutures are tied.

Nowadays, with our improved surgical methods and antiseptic precautions, these plastic operations on the vagina are usually successful; but, unfortunately, under the strain which is put upon the new-formed cicatrices by the majority of the women in whom this accident occurs, sooner or later the prolapsus is very liable to return. This applies especially to cystocele and to complete prolapsus of the uterus and vagina, much less to rectocele. For this reason we prefer not to operate on a cystocele whenever it can be comfortably retained by the Gehrung pessary. A rectocele, however, we always operate upon when its size seems to call for active interference. The longer a woman can be kept in the recumbent position, and the firmer, therefore, the cicatrices are allowed to become before a fresh strain is put upon them, the more likely is the result to be permanent. The details of the operations for prolapsus uteri will be given in the chapter devoted to that subject.

CHAPTER XII.

SURGICAL MEANS ADAPTED TO RESTORATION OF THE PERINEAL BODY

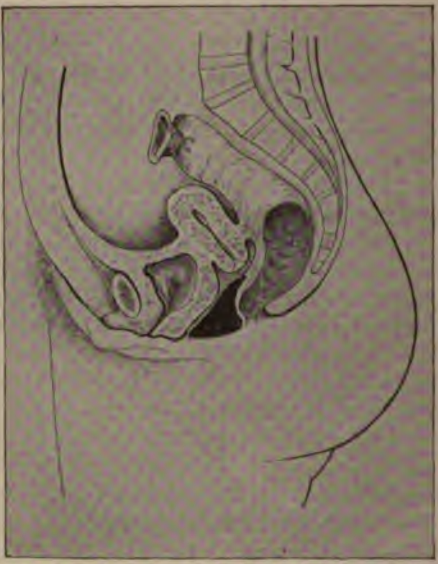
THE pathological conditions treated of in the two preceding chapters are so directly connected with loss of power in the perineal body that the surgical procedure adapted to the restoration of that part very naturally comes next under consideration.

We beg the reader to observe that the operative procedure about to be described is not limited to the cure of laceration of the perineum. It is appropriate to the restoration of the perineal body which has lost its power and function from any cause—rupture, subinvolution, senile atrophy, constitutional debility, or prolonged over-distension. The indication is to fill the triangular space created by the anterior curve of the posterior wall of the vagina and the posterior curve of the anterior wall of the rectum with a dense, resisting body, which will fit into the space, support the walls just mentioned, and act as the "keystone of an arch" which directly or indirectly sustains the bladder, the rectum, the uterus, and the intestines above. This is the comprehensive and broad view which should be taken of the operation, and upon its thorough appreciation and acceptance much will depend which is to follow.

All that is said as to the importance and treatment of destruction of the perineum in this chapter is based upon the facts stated in Chapter X. Before reading this the student is therefore urged to peruse that. Without that this would be superficial and imperfect; by its aid it will become much more thorough and comprehensive. In spite of the fulness with which the subject is dealt with there, we deem a slight recapitulation of salient points advisable here. In doing this we offer no apology for repetition of former statements, for we are advocates of the plan of a popular teacher of the French language, who instructs by "répétition sans cesse."

Anatomy.—Proceeding in close proximity with each other toward the pelvic outlet, the vagina and rectum diverge at a point above the perineum, the one arching forward in coincidence with the pelvic curve, the other slightly backward toward the coccyx. In this way an irregular triangle is created, of which the base is the skin between the fourchette and anus, one side the posterior vaginal wall, and the other the anterior wall of the rectum. This space is filled by a body having the union of muscular tendons as its base, and which is itself composed of fibro-elastic tissue. One of its sides resting upon the rectum, the other gives strength, elasticity, and firmness directly to the posterior wall of the vagina; while this wall, being by it pressed against the anterior or upper vaginal wall, sustains it and the bladder which lies upon it. Figs. 73 and 74 will show the relations of the perineal body and the effect of its removal upon the vaginal walls. The anterior or upper wall, after its removal by rupture, lacks support and falls downward, prolapse of this wall occurring, with cystocele. The normal direction of the posterior wall is also destroyed. Instead of its arching forward, with a gentle curve, toward the vulva, its lower portion runs like a turned letter ⊂, to the anus. The result of this change of direction, with the coincident loss of support from the strong elastic perineal body, is to create a sagging forward, and soon prolapse of this wall follows that of the anterior, and uterine displacement is a consequence.

Fig. 73.



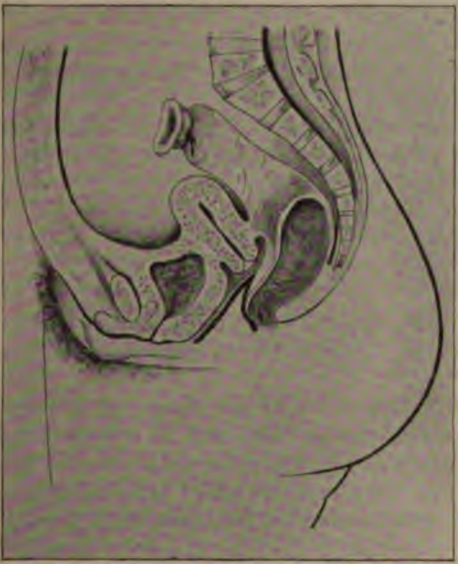
Perineal Body perfect; both Vaginal Walls sustained.

It may with some justice be remarked that Fig. 74 represents the perineal body not simply exhausted, but split through, as can only be done by laceration. It is true that in other conditions of loss of power there is an appearance of a perineum left, but it is the semblance of a departed power, and the diagram must in such cases, to a certain extent, be regarded as schematic, referring to absence of function rather than of tissue.

When a woman with a normal perineum is placed upon the back, and the finger of the examiner is passed into the vagina, as it passes over the perineal body it will be firmly pressed against the upper vaginal wall. Upon the withdrawal of the finger the separated walls will be observed to come in contact at once by the rising of the posterior wall. If the perineal body have lost its power, no such upward pressure is found to exist, and the vaginal walls are discovered to be in less close contact.

After operation for restoration of the destroyed perineum an examination of this kind should be made. If the upward pressure of the

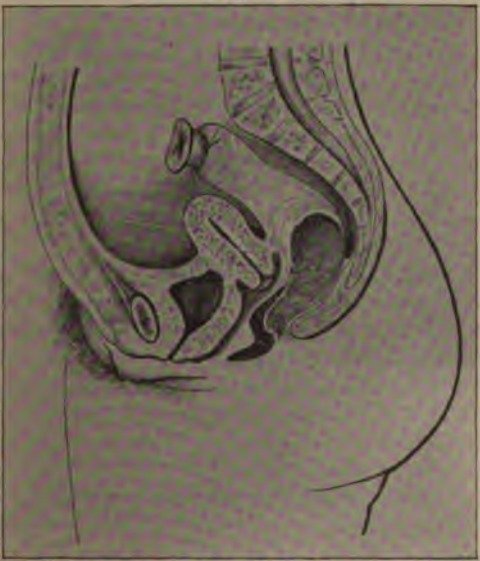
FIG. 74.



Perineal Body removed by Rupture; both Vaginal Walls robbed of Support.

perineal body is found to be sufficient to bring the posterior in contact with the anterior vaginal wall, the object of the operation has been

FIG. 75.



Perineum improperly Repaired; Perineal Body not restored to Place; Vaginal Walls not sustained.

attained. If it do not so, both walls will lack support, in spite of the fact that the superficial perineum, the base of the perineal triangle, has been united and appears perfect. The latter result will deceive the patient, and may deceive the surgeon, with false hopes. The former will alone give future immunity from the dangers of vaginal prolapse and its consequences.

Those influences which destroy the power of the perineum and render it incapable of its important functions are the following:

Constitutional feebleness;
Prolonged over-distension;
Senile atrophy;
Subinvolution;
Laceration.

All these, with the exception of the last, have been considered with sufficient fulness in Chapter X.; laceration requires more careful study here.

It being now understood that the repair of a perineum, the power of which has been destroyed from any of the causes mentioned, is to be conducted upon exactly the same principles as those which apply to the operation for laceration, we shall use this accident as a means of illustrating it, and confine our remarks to it during the rest of this chapter.

Varieties of Perineal Laceration.—All cases may be classed under two heads: Complete and Partial Rupture.

These include the following degrees of destruction:

Superficial rupture of the fourchette and perineum, not involving the sphincters;
Rupture to the sphincter ani;
Rupture through the sphincter ani;
Rupture through the sphincter ani and involving the recto-vaginal septum.

Complete rupture presents such serious discomforts as a consequence that partial rupture is by many viewed as a trivial circumstance. So it is by comparison, but so likely is it to be followed by prolapse of one or both vaginal walls that it should never be undervalued. As soon as such prolapse occurs uterine, vesical, and rectal troubles become almost inevitable.

The evils resulting from partial rupture are by no means insignificant, but they are more remote and more tolerable than those which follow complete. When the sphincter ani is torn through, and still more markedly when the rectal wall is ruptured, incontinence of feces and rectal gases occurs to such an extent as to embitter the life of the unfortunate patient. The consequences of rupture of the perineum may thus be presented:

Subinvolution of the vagina;
Prolapsus vaginæ, with cystocele or rectocele;
Prolapsus uteri;
Incontinence of feces and intestinal gases;
Prolapsus recti.

The first three of these may result from both varieties of rupture, complete and incomplete; the last two attend only the former. Even when the two passages are laid into one, it is sometimes surprising to see how little the patient may suffer; but generally under these circumstances her condition is truly deplorable. Fecal matters and gases pass without control, and the uterus, vagina, bladder, and rectum tend so strongly to descend that exercise, muscular efforts, or tenesmus produces weariness, pelvic pain, and traction upon the broad ligaments. In some instances so great is the disturbance of function that the unfortunate woman finds herself an object of disgust to her associates and even of loathing to her husband.

Subinvolution of the vagina is rarely alluded to as a consequence of rupture of the perineum; but we see the two conditions too often coexistent to regard it as a mere coincidence. "The muscular walls of the vagina," says Savage, "are not separable into coats or layers. Two-thirds of the thickness of the vagina, varying from 2–3 lines above to 5–6 below, are made up of this muscular portion: the inner third consists of a dense, cellular lining membrane inseparably united to it." The elastic, contractile elements of this canal are identical in structure with uterine fibre, and development occurs in them as in those of the uterus under the stimulus of gestation. A retrograde metamorphosis likewise affects them subsequent to labor. As this process is often interfered with in the uterus by rupture of the cervix, so is it in the vagina by rupture of the perineum. Let any one appeal to his own experience for the frequency of subinvolution of the vagina as a concomitant of rupture of the perineum. It may be objected that the latter often results from difficult and particularly from instrumental delivery, which may produce both conditions. An examination into the histories of cases will refute this; the result is often produced when the labor has been very rapid and unaided. It may again be suggested that prolapse of the vagina, a consequence of the rupture, excites excessive growth in its walls; but the two things coexist where perineal rupture has not resulted in vaginal prolapse almost as often as where it has done so.

Causes.—The power of the perineum may be destroyed by a number of influences, for which the reader is referred to Chapter X. of this work. For laceration of the perineum there are but two causes—first, by far the most common, parturition; and second, some accidental injury, such as the passage of large tumors, a fall upon a sharp object, etc.

Minute details upon this subject, and upon means which should be adopted for prevention, will be found in works upon obstetrics.

Prognosis.—In an incomplete case of slight character, where the fourchette and only a small portion of the perineal body are involved, no evil usually results. Laceration of this character and to this extent is the rule in first labors, and not the exception. It requires no interference, and is so insignificant in consequence that it is not included under the subdivisions which we have mentioned. Even the first and second degrees of laceration which we have tabulated are often productive of no evil, and may, unless careful inspection be made, pass unrecognized by both physician and patient. But this is the exception, and not the rule. The third degree is always an accident of gravity, while the fourth represents the most serious form of the condition. The greater the injury, the less likely will be spontaneous recovery, and the more probable the complications and results which have been mentioned.

Natural History of Perineal Laceration.—It is the general impression, and one which we formerly shared, that any laceration which does not entirely sever the sphincter ani may unite by first intention without surgical treatment, and that none which converts the two passages into one will do so. Even, however, when the rupture has been complete, it has been asserted that spontaneous cure has taken place. Observation at the bedside, however, has led us to question whether union by adhesion of the lips of these wounds ever occurs spontaneously. Very certain are we that in our own experience we have never seen one do so. Let the limbs be bound together ever so closely, the inevitable passage of lochial material between the cut surfaces prevents union by first intention. Repair is effected by granulation, and is often very good, but it is never perfect. We are not prepared to say that the statement is absolutely and universally true, but we believe it to be so as a general rule, that a lacerated perineum left to nature for repair is never afterward as perfect as it was before the occurrence of the injury or as it usually is after proper repair by surgical means.

How, then, is it, it may be asked, that so many women who suffer from laceration of the perineal body do not suffer from the consequences which have been mentioned? First, because, if the laceration does not interfere with vaginal involution, it often does no harm, or at least not for many years, when its connection with displacements is entirely forgotten; and second, because the imperfect repair effected by granulation is commonly sufficient to answer all purposes.

We are fully aware that many will be found who will positively affirm that they have seen even lacerations in the third and fourth degrees entirely repaired by first intention. "False facts," says Cullen, "are more dangerous than false theories." This we strongly suspect—though, as we have stated, we cannot assert—to be one. The ostium vaginæ just after delivery is, in its over-distended and always slightly lacerated condition, with folds of redundant vagina pressing down upon it, a most deceptive part. We have ourselves often been deceived as to serious laceration just after delivery, and we have frequently seen others similarly misled. A prolific field is thus open for error to the superficial and inexperienced examiner, who, having mistaken a slight laceration for one of aggravated character, and finding that repair has been effected by nature, asserts in future that he has known spontaneous recovery even after most extensive destruction of the perineum.

Should the case really be a serious one, however, and the practitioner one who believes that nature will in all probability repair the accident and restore the perineal body to its important functions, a golden opportunity will be lost, and the patient in all likelihood remain a sufferer in consequence.

Time for Operation.—Formerly, authorities differed widely upon this point, some urging immediate action, some advising delay until the effects of parturition have entirely passed away, while others compromise the matter by giving preference to the plan of waiting a few days only. As already stated, at the present day no conscientious obstetrician would hesitate a moment to close every perineal laceration immediately after the expulsion of the placenta whenever the rent seems to him sufficiently large to demand repair. An exceedingly rare exception might be made in cases where the woman is so exhausted by the labor as to forbid even the slightest prolongation of her sufferings, or where the parts are so bruised as to offer no chance of immediate union. The worst cases of the accident with which we meet generally follow instrumental or manual delivery, and when the discovery of its occurrence is made the patient will usually be in a profound anæsthetic sleep. Every operator should be prepared, under such circumstances, to attempt repair of the injury, for if he succeed the patient will be saved much suffering, while failure will not in any wise depreciate her condition. For this reason no case of obstetrical instruments should be considered complete which has not in it needles and sutures for performance of this operation. We have always resorted to immediate operation, and have never had occasion to regret our action. There are three circumstances which tend to defeat the success of immediate operation: First, it is often performed by one not habituated to its performance, and, being practised upon a woman who, having just been delivered, is exposed to the danger of post-partum hemorrhage, and surrounded by anxious friends, it is likely to be finished too hastily; second, the lochial discharge, constantly passing over the lips of the wound, is very likely to enter and prevent union; third, the operator having been taught to regard the perineum as the superficial layer of tissues intervening between the fourchette and anus, closes this by correspondingly superficial sutures, leaves the upper portion of the perineal body open, creates a pouch for the accumulation of putrefying materials, and leaves the anterior vaginal wall and bladder without support in the future.

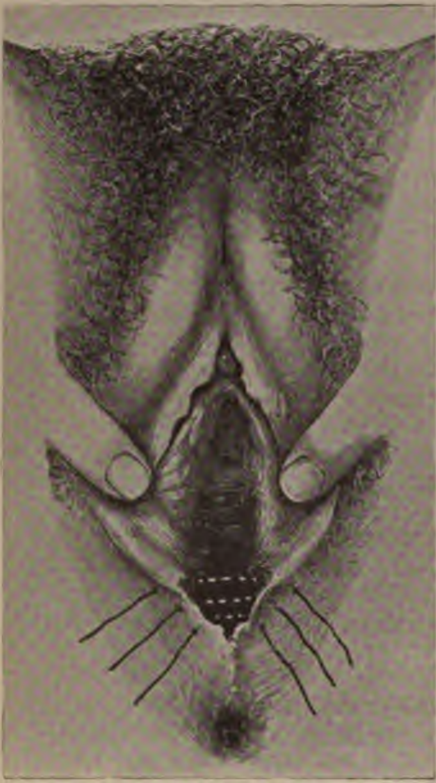
Our advice and practice with regard to this point are decidedly to give the patient the benefit of the doubt and to close the rupture at once. If failure follow, however, never, unless there be some special reason for so doing, attempt another operation before the results of parturition have entirely passed away. This will not be before the lapse of two months from the time of delivery: just after delivery there is a reason for operating which has passed away in a fortnight.

As we have elsewhere already remarked, it is our conviction that a very large number of cases of uterine disease take their origin in the lying-in chamber, and a large proportion of these are unrepaired cases of lacerated perinea. When immediate operation becomes the rule of obstetric practice, the number of cases of disease thus occurring will at once and very decidedly diminish.

But the full results of immediate operation will never be exhibited until the obstetrician studies the anatomy of this part, aud learns how to approximate its entire divided surface by sutures carried up to the highest point at which solution of continuity has occurred.

Formerly we employed the old-fashioned method of introducing the first suture at the lower angle of the rent, and the last one at the posterior commissure, of course always passing them as deeply as possible, so as to include the whole of the torn surfaces. This plan necessitated the use, in a deep laceration, of probably from four to six sutures, and had the disadvantage of allowing blood to flow over the wound while it was being closed. It was therefore possible that a perfect cleansing of the wound might accidentally not take place. Of recent years, however, we have adopted a much better plan, as follows: We take a strong curved needle, at least three inches in length, thread it with strong sublimated silk, and pass it from a point corresponding to the upper margin of the rent on one labium downward and backward above the upper angle of the laceration in the posterior vaginal wall, and out again at a spot corresponding to the point of entrance on the opposite labium, keeping the suture carefully concealed. The wound having been thoroughly cleansed by irrigation or sponging with a 1 : 5000 bichloride solution, this single suture is securely tied; in this way the floor of the vagina is at once closed, and the remaining perineal wound shut off from contamination by blood oozing from the uterus. Usually, now not more than two other comparatively superficial stitches have to be passed, care of course being taken that the deep portions of the wound are included and approximated when the sutures are tied. This operation is very easy of performance, requires but a few minutes, and is well borne even by very much exhausted patients. If for some reason only the first suture can be inserted and tied, a very good perineum would probably result, since the closure of the roof of the vagina would permit spontaneous union of the rest of the wound. We certainly think that by this method more than three-fourths of perineal lacerations are healed by first intention. We have even treated cases of complete laceration in this manner with fair success, although we admit that the proportion of good results is much smaller than in partial rupture. The sutures are usually removed between the fourth and seventh days, when they will have begun to cut, and, whether union has taken place or not, are no longer of any use.

FIG. 76.



Suturing of Freshly-lacerated Perineum.

Treatment of Cases which have Cicatrized.—The operation which is now generally adopted in these cases, and which has received the name of perineorrhaphy, consists in vivification of the edges of the lips of the wound and their approximation by sutures. Although the accident for which this procedure is instituted was described by the ancients, no surgical means of cure were ever advised for it until the time of Ambrose Paré. He advised the suture, and was followed in its use by his pupil Guillemeau. Subsequently it was employed by Delamotte, Saucerotte, Trainel, Noel, and others. Dieffenbach employed it successfully, adding to the operation oblique lateral incisions involving the skin and areolar tissue, for the purpose of relieving tension upon the parts brought together by suture.

About the year 1832, Roux of Paris obtained the most brilliant results from the operation, and probably its elevation to the position of a reliable surgical procedure was due more to his achievements than to those of any other individual. He employed the quilled suture, and cured by it four out of the first five cases operated upon. Although such success was obtained in France at this period, we find English writers as late as 1852 and 1853[1] doubting the efficacy of sutures and advising that assistance should be limited to aiding the efforts of nature.

Among the older operators within our own recollection by whom great advances have been made in this operation are Baker Brown in England; Verneuil, Demarquay, and others in France; Langenbeck and Simon in Germany; and Sims, Emmet, Agnew, and others in the United States. But within the last decade even these methods have become more or less obsolete, and newer and more perfect operations have been devised by Hegar, Martin, and Fritsch in Germany; Le Fort, Richet, and Doléris in France; Lawson Tait in England; and Emmet (new method) in this country. This operation, which in former years was shrouded in so much mystery and encumbered by such complicated and misleading explanations as to be but imperfectly understood by the majority of operators, has, through the labors of the men just mentioned, become one of the simplest achievements in gynecological surgery. Within our own recollection the late Prof. Simon of Heidelberg considered the cure of a complete perineal laceration a rather marvellous accomplishment, and he devoted much time and labor to the completion of his somewhat complicated method of operation; but nowadays, while failures do still occur after the operation for complete laceration, they are decidedly in the minority; in fact, the operation has now become one that is very generally performed, even by men who make no pretence to being specialists in gynecology; and there is no reason why this should not be the case, since, if the anatomy of the parts is carefully studied and correctly understood, it requires no very special surgical skill to do the operation properly and successfully. The old quilled suture, the cutting of the tissues alongside of the perineum, the division of the sphincter ani (except occasionally after complete perineorrhaphy), the dissecting of flaps from the neighboring cutaneous surfaces, and some other features, have long since become obsolete. In the following pages we shall describe the methods used by us and by several of the other gentlemen named above, because we think it our duty to place before the reader not only our own practice and experience, but also those of other operators whose methods may differ from ours. As no two cases need necessarily be alike, so may every individual laceration require a distinct operation by itself. To the ingenuity of the operator must be left the choice of one or the other method, or the advisability of combining the distinctive features of several operations.

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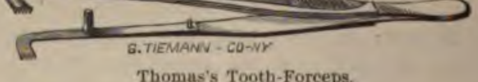
[1] Baker Brown, *Surgical Diseases of Women.*

We have retained in this chapter substantially the description and figures given in our last edition, because we did not see how we could alter the description in conformity with the newer methods of operation without completely changing the sense of the chapter. The old description has seemed to render the plan of operation so intelligible to the reader that we have hesitated to alter it, for fear of obscuring the meaning. We therefore continue to show the operation as we used to perform it, and as many still perform it, but in addition we give the descriptions and diagrams of newer and perhaps better operations.

Preparation of the Patient.—The general health should be carefully investigated. If it be bad the operation should be delayed, and the patient put upon tonics and placed under the best hygienic circumstances. For a week before operation the bowels should be kept lax by some mild cathartic, in order that after that time cure shall not be jeopardized by the coming down of scybalæ which have not been removed by a cathartic given twenty-four hours before operation. This point is one of a great deal of moment, and should not be overlooked. In cases of complete rupture it is better even to give a fortnight to the fulfilment of this indication. A compound cathartic or compound aloetic or rhubarb pill may be given every twelve hours, or a saline cathartic at the same intervals. Free alvine evacuation, not hypercatharsis, is what is required. During this time the vagina should every night and morning be thoroughly syringed out with warm water to remove secretions and quiet local irritation.

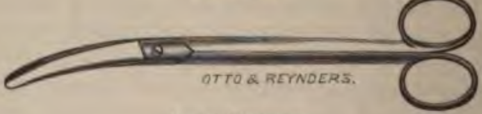
Instruments and Appliances Needed.—These will consist of a long-handled curved scissors; a bistoury with narrow blade; a tooth-forceps and tenaculum; one dozen small sponges (size of a walnut) fixed in handles ten inches long; artery-forceps; silk ligatures; and straight darning needles threaded with silk, which is double and tied at the

FIG. 77.



Thomas's Tooth-Forceps.

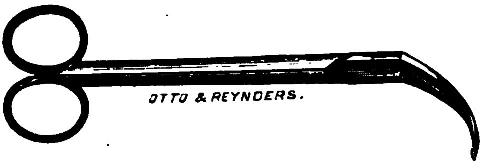
Fig. 78.



Curved Scissors.

eye of the needle by as small a knot as possible. A basin of water should be in readiness to receive the bloody sponges, and a pitcher, bucket, or other reservoir at hand to supply more when this is to be changed. The instruments should be kept immersed in carbolized water, with which the parts should be freely bathed.

FIG. 79.



Emmet's Scissors, sharply curved.

Operation for Partial Rupture.—It is a matter of great surprise to us that no distinct separation should be made by many of the older writers between the descriptions of operations for partial and complete rupture. The first is a procedure in which the merest tyro should succeed; the second is one of the most delicate and uncertain operations in gynecology, in which even the most skilful may fail. We feel sure that evil has arisen from confounding a simple and a difficult procedure, and shall make a wide difference between them.

The operation for partial rupture has for its sole object the restitution of the perineal body. That for complete rupture has for its main object the restoration of the power and functions of the sphincter ani. After the main object of the second operation has been attained, that of the first should claim attention.

Before describing these operations we would say a few words upon division of the sphincter ani. [I have operated a great many times for rupture of the perineum, and cannot recall a case of final failure; thus far I have never cut the sphincter. My experience, confirmed by that of many others, leads me to indorse Dr. Savage's statement, that "the success of operations for the closure of perineal lacerations is obviously not promoted by the division of the superficial anal sphincter."—T. G. T.]

[I do not agree with this opinion, so far as it applies to *complete* laceration, since I am quite sure that by cutting the sphincter posteriorly, after closing the rent, and inserting a rubber tube, I have not only prevented the distressing symptom of rectal tenesmus, but have also permitted free escape of flatus, thus ensuring the union of the sphincter muscle.—P. F. M.]

Let the operator keep clearly in mind the shape and dimensions of the body which he is about to restore. It is a triangle with apex above and base below. Two surfaces of this shape are to be vivified and held face to face by sutures. That is the whole operation.

First Part of the Operation.—The patient, dressed for bed, should be placed upon a table before a window admitting a strong light, in the position for lithotomy, and put under the influence of ether. Four assistants will be serviceable, although three would answer the purpose. One of these should administer the anæsthetic, one should hold each knee, and the fourth should attend to the duty of handing the required instruments to the operator and washing the sponges as they become bloody. The assistants, lifting the feet from the table and flexing the thighs, so that the edges of the tibiæ will be horizontal, should hold the knees clasped under the arms and steady the feet with the hands of the same side, while the unoccupied hands of the other side retract the labia and expose the ruptured part. These directions should be observed by the assistant holding the right knee; he who holds the left should do so with the right arm, clasping it with this and retracting the labium with the right hand, while with the left he sponges the wound with sponges held in long handles, which do not cause his hand to obstruct the operator's view. It will at first appear that it would be difficult for one assistant to do all this. Let him who thinks so try it, and he will find that it is not so, and that such arrangement of his aids will be greatly to his advantage. This operation, like so many others in surgery, often fails, or at least drags heavily in its progress, from the want of a sufficient number of assistants, to each of whom is allotted an especial duty.

All being now ready, the index and middle fingers of the two assistants who hold the knees are fixed upon the labia by the operator, and, the degree of traction which they are to practise being regulated, the operation is begun.

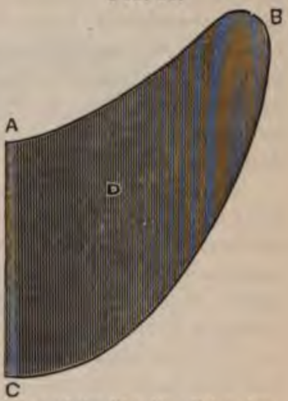
Seizing the tissue just above the anus with tooth-forceps or a tenaculum, a strip of mucous membrane is removed from the posterior vaginal wall and from the original site of the perineal body upward as far as it is proposed to extend to the rectal side of the triangular denudation to be created on each side.

The rectal side of the new perineal triangle then is created by denudation of the posterior vaginal wall. If the base or rectal side of this triangle does not involve the posterior vaginal wall, what does it involve? This was the original site of the perineal body. Its anterior or vaginal side was originally vagina, and the posterior vaginal wall now prolapses and usurps the place of this body.

In reference to the organization of the present operation of perineorrhaphy, or at least as regards all its essential features, it may be stated that the credit of making it a colpoperineorrhaphy and rendering it a remedy for rectocele belongs to Baker Brown. A reference to his work will put this beyond question, as he represents the operation in a diagram with this descriptive statement, "Operation for Rectocele." His operation combined all that is essential in that which is now, with little modification, generally accepted. Since his publication of it no one has materially altered it except Marion Sims, who performed the important function of stripping the procedure of certain superfluities, like section of the sphincter and the use of quills, which were not merely useless, but absolutely hurtful.

We have now formed what is to be the base and line of union of two triangles, which meet upon the furrow just created. Now, catching up the tissue on the inner side of one labium majus, about midway between meatus and anus, another furrow is cut extending down to the anal origin of the first furrow, and another is then carried from the point selected on the labium backward to the upper or vaginal extremity of the basic furrow. A triangular space, covered by mucous membrane, mapped out by three bleeding furrows, will be left, as shown in Fig. 80.

FIG. 80.

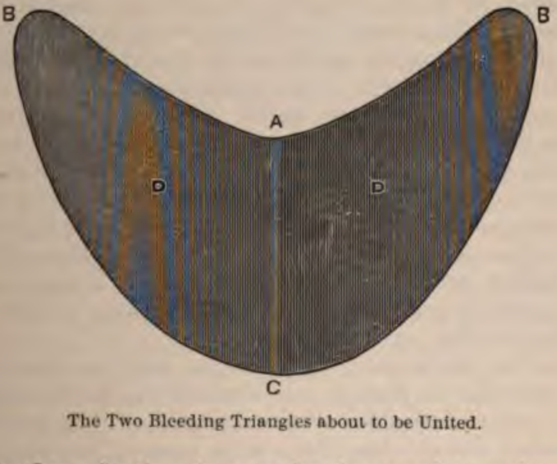


One of the Bleeding Triangles which are to be Created.

C A. furrow extending from anus up the vagina (the rectal side); C B, furrow extending from anus to point midway up labium majus (cutaneous side); B A, furrow extending from point on labium to vaginal extremity of rectal furrow (vaginal side). Now the tissue in the unabraded triangle D is removed by tenaculum and scissors, as little tissue as possible being cut away, and a bleeding triangle is left. The opposite side is similarly treated, and the result is two such triangles placed base to base upon the line C A. The doubling over of these upon each other, and the securing them in contact by suture, constitute the second part of the operation, as shown in Fig. 81.

In performing the first part of the operation we very commonly begin on one side, and cut successive strips across until the whole surface is pared; but the method which we have mentioned simplifies the procedure, and after adopting it once for the complete understanding of the operation the operator may afterward do otherwise.

FIG. 81.



The Two Bleeding Triangles about to be United.

This part of the operation may be performed by the knife, but it is done more expeditiously and with less hemorrhage by the scissors, as Emmet has so justly pointed out. E. W. Jenks of Detroit has proposed another method of denudation, which consists in the introduction beneath the mucous membrane of a pair of sharp-pointed scissors, by which, without for a moment removing them, he by rapid snips separates the membrane from its attachment and removes it with great rapidity and little loss of blood. All the denudation done is effected in this this manner. We have employed this method on several occasions, but have abandoned it on finding that, while apparently bloodless, on removing the flap of vaginal wall thus separated the hemorrhage was so profuse as to require a number of arterial ligatures, and the sutures had to be passed much more deeply than when superficial strips of mucous membrane were removed, one by one, until the whole surface was denuded.

The whole surface having been pared, the operator stops and carefully examines to see if any arteries are spouting and if any undenuded surfaces still remain. If he find the former he twists them, and, if necessary, ties them with very delicate catgut ligatures, which he cuts short; if the latter, he catches them with the tenaculum, and with the bistoury cuts them away.

The first step of the operation is now finished. The operator should not hasten to the second, for the tissues should be exposed for a while, that he may be assured against hemorrhage. It is not necessary, however, to wait until hemorrhage has ceased before applying the sutures, since superficial oozing is checked, and even spurting arteries are compressed, by the tying or twisting of the sutures.

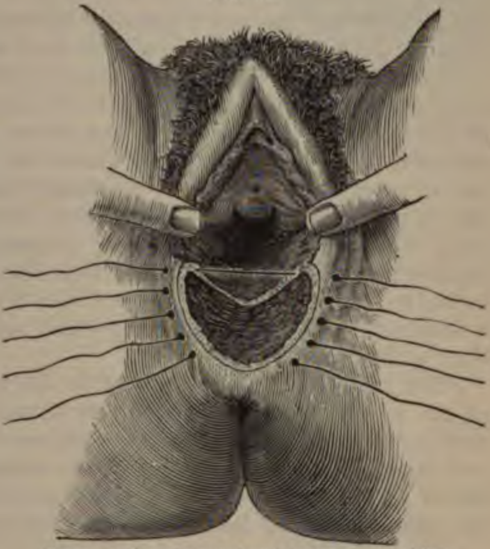
Second Part of the Operation.—Now, taking in the needle-holder a round, curved, or straight needle, about two and five-eighths inches long, which will cause less hemorrhage than the needle with cutting edges, armed with a doubled silk thread, giving a loop about eight or ten inches long, he inserts it opposite the lowest external angle of the vivified triangle, which would be a little above the level of the anus, and makes it pass across the middle of the united bases of the triangles, over the rectum, and emerge at a corresponding point on the opposite side. This suture is nowhere visible within the vagina, for it lies imbedded in the tissues lying over the rectum. It may be passed by one sweep, or, if this prove difficult, may be drawn out at the middle of its course and reinserted. The suture is twisted at its extremities and left in position, and, another being taken, it is inserted above the first, and made to pass through the tissues at a higher point of the vivified surface. Guided by the finger in the rectum, it is kept imbedded in the recto-vaginal septum and emerges at a point on the other side corresponding to that of entrance.

This, like its predecessor, we are in the habit of concealing in the tissues, so that after its passage it is nowhere visible within the vagina. We believe that an imbedded suture excites much less irritation on the denuded surface and acts less like a seton upon it than an exposed one. In this way sutures of silk are passed, and by them those of silver are immediately drawn into place, about one-third of an inch apart, and inserted at a quarter or half an inch from the edges of the wound. All these are concealed from view, except the last one or two, which should pass under the upper angles of the triangles, and, catching up the vaginal tissue at the highest point of the denudation, should bring them all together.

Of late years we have used silkworm gut almost exclusively for this operation, threading it directly into the needle. It is less painful than wire, and less likely to produce suppuration than silk. Of course it has been properly asepticized, as described on p. 62. It must be removed at the proper time precisely like silk or wire, as it is not absorbed.

At each side of the perineal triangle thus formed two pockets may be created in which putrid materials may collect. To avoid this, great care should be taken to conceal the sutures, especially at these points. Denudation should likewise be most carefully practised there.

FIG. 82.



Shows Surface denuded and Sutures in Position.

For the details as to the method of drawing the wires into place and twisting them the reader is referred to the article on Vesico-Vaginal Fistula. After the plan there described he twists them one after the other from below upward. If it appear necessary, superficial sutures of catgut are then passed between the deep ones to approximate the cutaneous surface more completely.

The wire sutures should not be cut short, but left about two inches long, then twisted together and secured by a small piece of India-rubber tubing, after a plan suggested by Emmet. The patient is then put to bed; the knees are loosely bound together; the dorsal or lateral decubitus preserved; the urine drawn by catheter every six hours or voided spontaneously by the patient if able, a tepid vaginal irrigation being given after each voluntary urination. As the bowels have been thoroughly moved, according to directions, before the operation, there is no need of disturbing them for the first two or three days afterward; but on the third, or latest on the fourth, day gentle laxatives should be given, either calomel in one-tenth grain doses every half hour until ten or fifteen have been taken, then to be followed by drachm doses of Rochelle salts in hot water every half hour until from four to eight have been given, or a compound licorice powder or a mixture of cream of tartar, sulphur, and sulphate of magnesia, equal parts, may be administered, if necessary aided by a warm enema, and the bowels thus be freely and gently moved. At least every other day a movement should be secured by means of a mild laxative or an enema, until about the seventh to the tenth day, when the sutures should be removed. This early moving of the bowels is a radical departure from the old-time custom of constipating them and not having them moved until after the removal of the sutures. Its introduction is chiefly due to the late Prof. Simon of Heidelberg, whom we saw use this method about twenty years ago. It is much superior to the old method of constipation, which was far too frequently followed by a rupture of the new cicatrix during the passage of the hard scybalous masses.

Operation for Complete Rupture.—Complete perineal laceration always involves rupture to a greater or less extent of the anterior wall of the rectum. If rupture of the bowel extend for more than from one inch to an inch and a half above the upper edge of the sphincter ani, it is better to close it by a primary operation consisting of vivifying its edges and uniting them down to the anus. After union of these parts closure of the perineum may be practised. If the bowel be not injured above an inch and a half from the sphincter, one operation will suffice to close the whole. We would not be understood as making this a dogmatic rule, but merely one which approximates the line of conduct which we deem best.

The sole object of the operation for partial rupture is restoration of the perineal body. The objects of the operation for complete rupture are—first, restoration of the sphincter ani muscle to all its power and functions; second, closure of the rectal opening; and third, restoration of the perineal body. What constitutes the main object in the first operation is the least important of those striven after in the second.

FIG. 83.

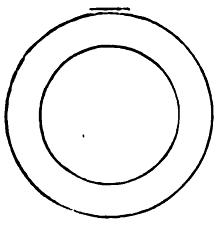


FIG. 84.

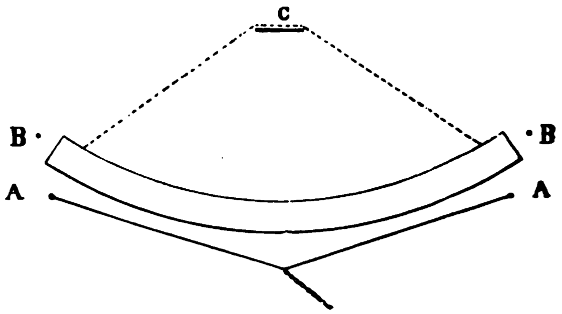


FIG. 85.

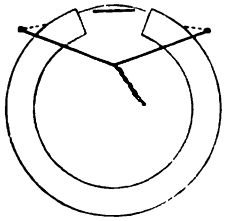
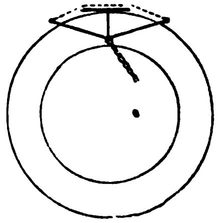


FIG. 86.



FIGS. 83-86.—Diagrammatic Representation of Union of Ruptured Sphincter Ani (Emmet).

The operator must then appreciate that mere closure of the rent in the genital fissure is not what is desired. He may gain this and not benefit his patient in the least, for incontinence of feces and gases may continue. Success involves always complete union of the ends of the severed muscle and complete closure of the rent in the bowel. To secure these the ends of the muscle, spread out and expanded, must be curled up and approximated, and the recto-vaginal septum must be drawn up and united to them. With these facts in view, clearly defined and appreciated, the difficulties of the operation greatly diminish. To no one are we so much indebted for their demonstration and illustration by practical results as to Dr. T. A. Emmet, who in 1873 wrote a valuable paper upon the subject, giving a clear exposition of the peculiar action of this accident upon the sphincter ani, and of the best method of restoring it to its normal shape and functions.

Let Fig. 83 represent the perfect sphincter; Fig. 84 will show it ruptured and spread out, with the point of insertion and exit of the needles. The dotted line shows the course of the metallic sutures imbedded in the tissue. It will be seen that the remaining recto-vaginal wall is a fixed point, and that as the wire is twisted the ends of the muscle are elevated, and the three points approach each other, as shown at C. As the twisting goes on these points come nearer and nearer together, as seen in Fig. 85, until at last they unite as shown in Fig. 86.

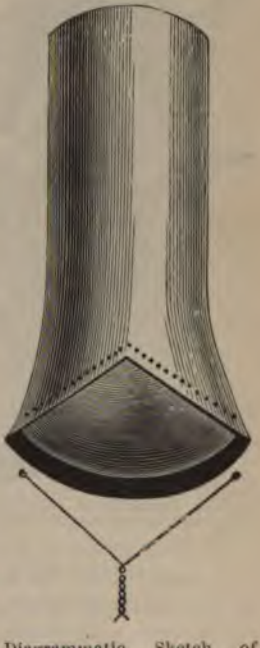
Should the first needle be inserted and drawn out above the end of the broken muscle, as shown in B B, Fig. 84, the tissue at this point will be approximated, and the ends of the muscle brought close together, but absolute and complete union will not have been attained and loss of function will still exist. The first suture is the important one, and must catch the ends of the broken and expanded muscle so as to lift them upward into contact with each other and with the recto-vaginal septum.

In vivifying the parts before insertion of the needles two lateral triangles representing the perineal body split in two are denuded, and the line of denudation is prolonged backward along the edge of the recto-vaginal septum. The border of the rectal mucous membrane at the extremities of the broken muscle, as far as the upper end of the rent in the bowel, is the guide for doing this.

Fig. 87 is a schematic diagram showing the ruptured bowel, the expanded muscle at its anal extremity, the insertion and exit of the needles, and the course (dotted lines) of the imbedded sutures. The line of denudation is marked out by the course of these sutures.

The rectal rent presents itself to the operator as an imperfect isosceles triangle, apex above and base below. The two lateral borders of this are the parts to be vivified. The two basic angles are on a lower plane than

FIG. 87.



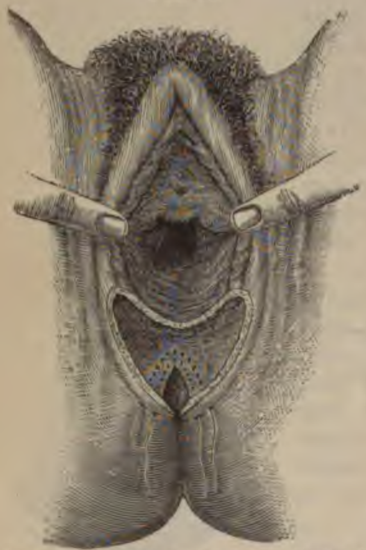
Diagrammatic Sketch of Course of First Suture for Union of Ruptured Sphincter Ani.

that of the apex, and are less fixed in their position. As the three angles are acted upon by the constricting influence of the encircling suture as this is gradually twisted, the two movable basic angles are elevated to the plane of that of the apex, while the latter is by traction drawn down to meet them. Coincidently, the denuded sides of the triangle are of course approximated, and thus the rectal opening is completely closed.

To sum up this part of the subject, the rule for passing the first suture consists in the introduction of the needle as low down as the lower edge of the anus. From this point it passes upward through the recto-vaginal septum, completely encircles the rectal rent, and comes out alongside of the lower edge of the anus on the opposite side.

Let the reader refer to Fig. 84 and he will appreciate that a suture which takes this course, like the string at the mouth of a bag, puckers the open parts, draws them into apposition, and controls the action of the sphincter. The two conditions which we have to fear as sources of failure after this operation are—first, recto-vaginal fistula, and second, non-union of the sphincter. This method to a great extent secures us against both. The subsequent steps of this operation are the same as those of that for partial rupture.

FIG. 88.



Surface denuded in Complete Perineal Rupture, and First two Sutures in Position.

We have in a large experience with this operation failed a certain number of times. As it is from our past failures that we must learn to avoid failure in the future, we shall strive to give the reader the benefit of our experience. In several of our cases perfect union was obtained, but the rectum was found, in spite of the fact that in both cases catharsis had been kept up for a week, filled with large, hard, scybalous masses. This created violent tenesmus, and destroyed the newly-formed perineum.

In several other cases a large rectal plug of soft inspissated fecal matter had been left in place in spite of thorough catharsis, and its necessary removal by the fingers or a spoon ruptured the united extremities of the sphincter muscle, leaving the perineum whole.

In one case the nurse in using the syringe for a rectal injection unquestionably passed its nozzle repeatedly between the lowest suture and that just above it, leaving a central opening in the perineum, which constituted a recto-perineal fistula, the sphincteric union remaining perfect.

Upon the experience thus obtained we have predicated the following rules of practice, which we invariably observe and strongly recommend:

1st. When about to operate for complete perineal laceration give *one entire week* to complete evacuation of all scybalous masses from the intestinal canal. This tract, it must be remembered, is twenty-five feet long, and keeps fecal masses stored up in it for months. Do not practise hypercatharsis, but let the patient have two medicinal evacuations in every twenty-four hours. This may be done by giving one compound rhubarb or compound cathartic pill every eight, twelve, or twenty-four hours, according to the patient's susceptibility to catharsis.

2d. During this time feed the patient freely upon animal food and animal broths, wheat, potatoes, and other nutritious articles of diet.

3d. During the first four days after operation sustain her entirely, though thoroughly, upon strong animal broths alone, avoiding milk especially, which creates scybala of hardened casein. The reliance upon milk for avoidance of scybala is a mistake.

4th. Do not disturb the bowels for two days after the operation. At the end of that time they should be acted upon by a gentle laxative or enema.

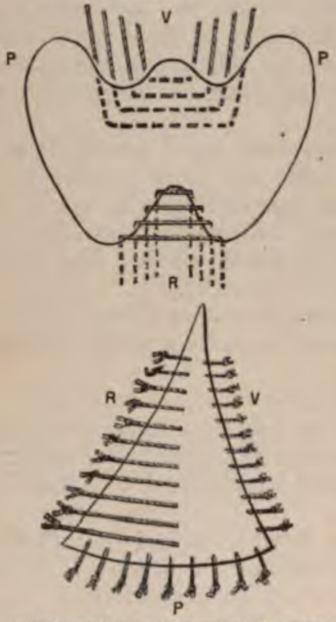
5th. If a rectal tube be employed, let it be one of small size.

6th. Should an enema be used, let the physician himself administer it, unless the capacity of the nurse be above suspicion. Remember that the rectal tube should be carefully passed backward, so as not to interfere with the recto-vaginal septum.

Every surgeon must admit that no detail is too insignificant for his personal attention which is capable of turning the balance in favor of or against the success of an operation which he has performed.

Formerly it was thought necessary in cases of very deep perineal laceration extending one or more inches up the recto-vaginal septum to perform the operation in two steps—first, closing the recto-vaginal rent, and several weeks later restoring the perineum; but it is chiefly owing to the genius of Simon of Heidelberg that we have found it possible to complete both these steps at one sitting. His method of operation was peculiar, tedious, and from our present standpoint unnecessarily complicated. He first denuded the whole area of laceration, then introduced a row of silk stitches into the recto-vaginal septum, which were knotted one after the other in the rectum, the sutures being carried out of the anus; secondly, he did the same with the vaginal surface of the rent, knotting the stitches in the vagina; and thirdly, he closed the cutaneous wound by a number of stitches. There were thus three sets of stitches—rectal, vaginal, and perineal. The rectal and vaginal were allowed to slough out; the perineal were removed about the tenth day. His successes were very good, as we ourselves have had opportunity to observe. This operation may properly be called the ideal operation for complete laceration of the perineum and recto-vaginal septum, since it approximated on strictly surgical principles each of the parts which it was intended to unite. However successful this operation may have been and always will be in a certain number of cases, there are some instances in which the recto-vaginal suture will fail to secure a perfect union, and a fistula will result, usually just within the posterior commissure. In order to avoid this very unfortunate occurrence, which is perhaps mostly quite unavoidable, some operators have vivified and closed the recto-vaginal rent by means of catgut sutures, one set being tied in the rectum, the other set in the vagina, and when complete union had been achieved have closed the now incomplete laceration in the manner already described or by one of the methods still to be reported. In our experience, however, the necessity for this double operation is exceedingly rare.

FIG. 89.



Simon's Operation for Complete Laceration of the Perineum. (Sectional view, diagrammatic.)

Emmet's New Operation for Lacerated Perineum.—At the meeting of the American Gynecological Society in 1883, Dr. T. A. Emmet described an operation for lacerated perineum which has attracted a great deal of attention, and which in the opinion of the inventor is destined to remain one of the established operations in gynecology. Dr. Emmet very correctly took the view that in order to completely restore the anatomy and functions of the female perineum it was necessary to bring the fibres of the pelvic fascia and of the torn muscles of that body directly in apposition, and so retain them. This he claimed the previous operations did not perform. Dr. Emmet denudes two elliptical surfaces in either lateral furrow of the vagina, beginning at the posterior commissure in the median line and extending up variably from two to three inches. The limits of these two lateral denudations are the internal border of the posterior commissure, the lowest caruncle of the hymen on either side, and the crest of the rectocele in the centre. The edges of each lateral wound are then united by sutures which are carried deep into the furrow and entirely under the raw surface, so as to pick up the separated fibres of the pelvic fascia when first one side and then the other is sutured. There remains only a very shallow slit of mucous membrane in the median line to stitch together, which is done with silk. To remove the stitches it is only necessary to elevate the anterior vaginal wall with Sims's speculum.

Theoretically, this operation is exceedingly plausible, and would be the ideal one if it actually lifted up and retained the separated fibres of the perineal body, but in practice, unfortunately, it, in our opinion, fails to do this. It restores most perfectly the calibre and relations of the posterior vaginal wall, but it leaves the vulvar orifice gaping as before, and therefore does not respond to the requirements of a perfect operation for perineal laceration. It is a beautiful operation for rectocele, but that is all.[1] This operation, it should be distinctly understood, is not applicable to complete laceration.

FIG. 90.

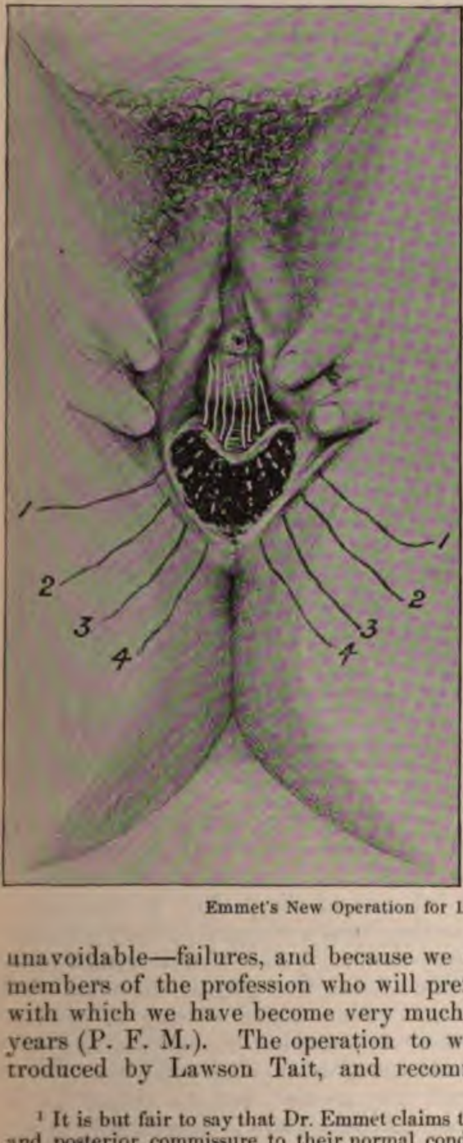
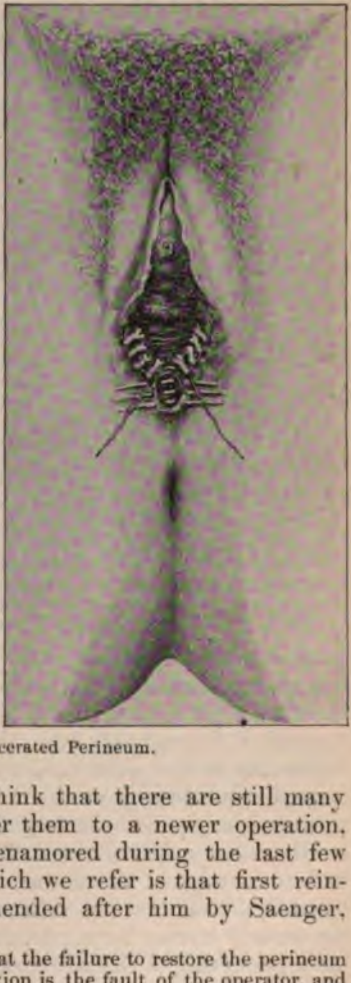


FIG. 91.



Emmet's New Operation for Lacerated Perineum.

Flap-splitting Operation for Lacerated Perineum.—As already stated, we have described the above operations because, in part, we have been very successful with them in past years, barring a certain number of—as we then thought unavoidable—failures, and because we think that there are still many members of the profession who will prefer them to a newer operation, with which we have become very much enamored during the last few years (P. F. M.). The operation to which we refer is that first reintroduced by Lawson Tait, and recommended after him by Saenger,

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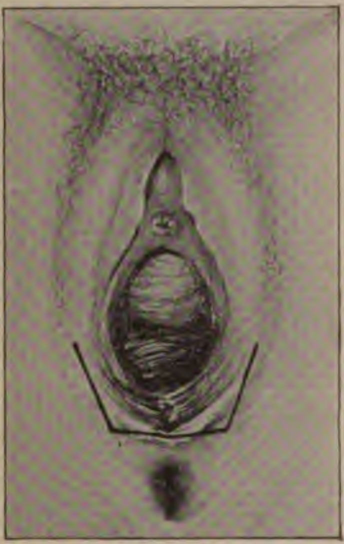
[1] It is but fair to say that Dr. Emmet claims that the failure to restore the perineum and posterior commissure to their normal condition is the fault of the operator, and is due to the fact that the area of denudation is not sufficiently broad in the centre, and is not carried high enough up on the sides.

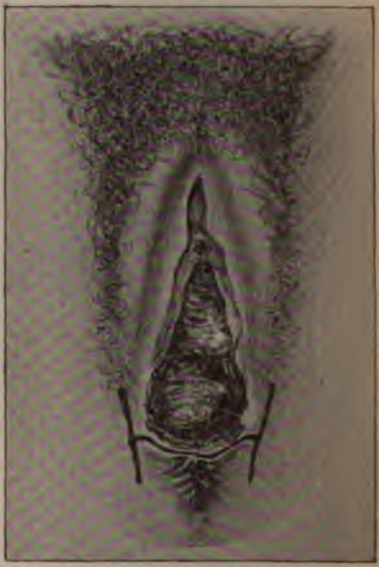
Martin, and others. It differs essentially from the methods already described, in that no tissue whatever is removed, but the result is achieved by simply splitting transversely and perpendicularly the surfaces thereafter to be united. This method is perfectly applicable, in our opinion, to complete lacerations of the perineum, but it is equally useful in incomplete rupture. It may briefly be described as follows: The patient being placed, after the usual preparations, in the lithotomy position, the recto-vaginal septum is split from side to side, beginning in the median line, by means of a pair of sharp-pointed scissors. If now the laceration is an incomplete one, the incision is carried up on either side to the upper border of the perineal cicatrix, the depth of the wound upward being not more than from a quarter to a half inch. The upper or vaginal flap is then drawn upward by means of a tenaculum or forceps, the lower or rectal flap downward by similar means, and the sutures are then passed, carefully concealed throughout, from the left side of the patient to the right, beginning at the point nearest to the anus, a straight or very slightly curved needle being used. In our opinion it is best to introduce the sutures just outside the edge of the wound, emerging at the same spot on the other side. Lawson Tait has recommended passing them just within the edge of the wound, but we do not think this method as good, because the edges of the skin are not brought into close apposition. All the sutures having been introduced, they are tied, and the almost inevitable puckering of the posterior vaginal commissure is corrected by short interrupted catgut sutures, so as to ensure complete closure of the wound at that point.

FIG. 92.



Flap-splitting Operation for Incomplete Laceration of Perineum (lines of incision) (diagrammatic).

FIG. 93.

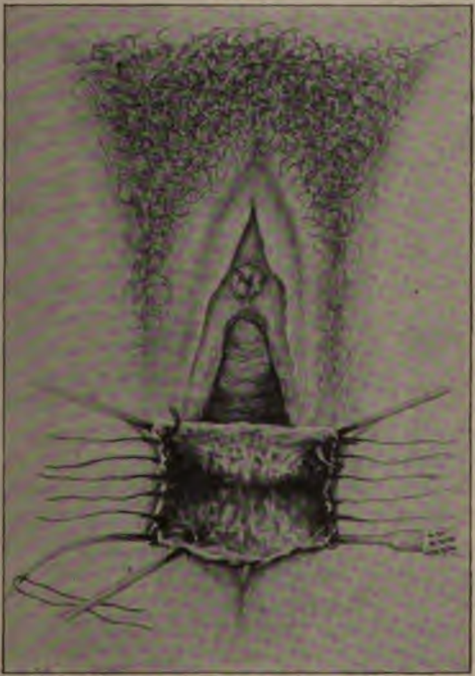


Flap-spitting Operation for Complete Laceration of Perineum (lines of incision) (diagrammatic).

In complete laceration the operation differs only in one point—namely, on either side of the transverse incision which splits the recto-vaginal septum a downward and backward incision is carried, which goes just beyond the edges of the separated sphincter ani muscle. The flaps upward and downward are held apart precisely as already described, and the first suture, beginning from behind, is inserted just outside and below the edge of the torn sphincter ani, and brought out exactly at the same spot on the opposite side. After this the stitches are introduced precisely as in the incomplete laceration.

The advantages of this operation are twofold: First, the rapidity of operating, which in our opinion is not a matter of so very great importance as it has been made to seem by its ardent advocates. The operation can be performed either in incomplete or in complete laceration within ten minutes, but if we wish to secure perfect skin-union it is necessary to introduce a certain number of superficial catgut sutures into the perineum or along the vagino-perineal commissure; and the better apposition we secure, the smoother and more perfect the line of union achieved. Therefore, we have found that it is better to procure perfect adaptation than it is to do a hasty operation.

FIG. 94.

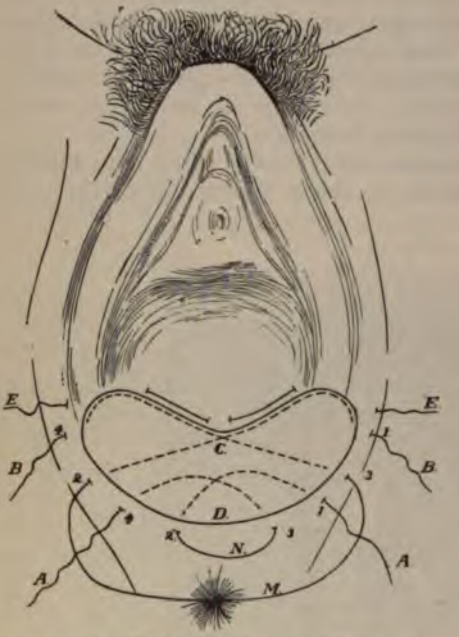


Flap-splitting Operation for Lacerated Perineum (Appearance of Wound and Introduction of Sutures for both Varieties).

Second, chiefly as regards complete lacerations, we have found the results to be very much more certain in securing a perfect restoration of the function of the sphincter ani and in preventing the formation of recto-vaginal fistula than with the methods which we have described above, and with which we had been more or less successful for many years. The shortest time in which we have performed this operation for complete laceration has been seven minutes, the longest forty minutes, the latter being a case where the operation had been twice attempted before by other operators and by other methods without success, and where the subject was exceedingly fleshy and a number of spurting arteries required ligation. The result, however, was in every respect a perfect one.

Very recently an ingenious method of introducing the sutures has been described by Dr. Clement Cleveland of New York, the nature of which will be seen by studying the accompanying diagram. He claims for it ease, rapidity, and a more thorough coaptation of the wounded surfaces.

Fig. 95.



Cleveland's Suture for Lacerated Perineum.

Dangers and Evil Results of Secondary Perineorrhaphy.—If we were asked the question if this were a dangerous operation, we should unhesitatingly reply, No. It is no more dangerous than any ordinary cutting operation whereby certain organs, vessels, nerves, etc. are injured in any other part of the body, and under our present aseptic rules certainly no accident should result from a perineorrhaphy. Still, we remember having in past years seen a case of fatal tetanus, and quite recently of fatal septicæmia, follow this operation; but we believe that with the experience afforded us by these two accidents, only one of which occurred in our practice, we can avoid their repetition. Of course, formations of pus along the track of the suture, œdema, or sloughing of parts of the wound, would require removal of the offending sutures and treatment on surgical principles. One of the most disagreeable results following a perineorrhaphy is the formation of a recto-vaginal fistula. If this does not close spontaneously—as it is very apt to do if the bowels are kept regular, thorough cleanliness is observed, and the fistula is not too much interfered with—the only rule of treatment is to split the new perineum down to its original degree of laceration, and to reunite the surfaces by one of the methods already described. The attempt to cure a recto-vaginal fistula by paring and suturing its edges will mostly prove a failure, whether it be undertaken from the vagina or rectum, or both. A perineo-vaginal fistula is usually of no consequence, and will close on cauterization; if not, it may be left alone. A recto-perineal fistula is, however, more annoying, and will probably have to be treated upon the principle of the usual anal fistula.

Usually a perineorrphaphy should not be followed by a rise of temperature; if such does occur, it is well to inspect the edges of the wound for œdema or the ischio-rectal fossæ for tumefaction, cellulitis, and abscess, which should be treated, if found, on general surgical principles. Nowadays we expect a secondary perineorrhaphy to be in ninety-nine cases out of a hundred a complete success. Still, we are willing to modify this statement somewhat when referring to operations for complete laceration, in which the special difficulty of the operation, the trouble of moving the bowels effectually and easily, and perhaps unforeseen complications, may cause a certain number of failures, chiefly consisting in incomplete union of the sphincter or a small recto-vaginal fistula, the whole number not aggregating more than 10 per cent. In operations for incomplete laceration we have no failures to record.

When a rectocele and an incomplete perineal laceration are present in the same subject, it is not necessary to perform two different operations at separate intervals, since by means of Hegar's operation, described under Rectocele, both conditions can be cured in one sitting.

Various kinds of sutures are employed by different operators: some use catgut exclusively, others silk, others silkworm gut, and others again silver wire. We, for our part, prefer catgut for sutures which are buried or difficult of removal, as on the posterior vaginal wall, and of late years silkworm gut for the closure of the external perineal wound. We find the latter much less painful than the silver wire, which we employed for many years before the silkworm gut became popular, and we think it less irritating and less liable to cause suppuration than silk; still, this may be a matter of opinion, and we do not pretend to being infallible on this point.

CHAPTER XIII.

MALFORMATIONS AND DISEASES OF THE HYMEN.

Anatomy and Physiology.—The hymen is a small, usually crescentic membrane, which separates the vulvar cleft from the vaginal canal, and may be considered as the portal to the vagina. Anatomists are still in doubt as to whether the hymen is formed by a centrifugal growth of skin after the completion of the vaginal canal, or by a perforation of the closed lower end of Müller's ducts. The latter view would seem to the more plausible one.

There are many conformations of the hymeneal membrane, all of which may be perfectly normal and physiological. Thus we may have a hymen shaped like a crescent, both horns tapering away toward the vestibule (Fig. 97); or the membrane may encircle equally the whole vaginal orifice, its opening being in the centre, the usual form (Fig. 96); or, instead of one central opening large enough to admit the point of the index finger, the hymen may be perforated by a number of small openings (Fig. 100); again, it may be a large, fleshy, very distinct menbrane, or it may be only a slender band encircling the vaginal opening. Its edges may be so tense as to tear even under the very slightest efforts at dilatation, and again it may be so elastic as to readily admit two fingers, and even an average penis, without laceration.

FIG. 96.

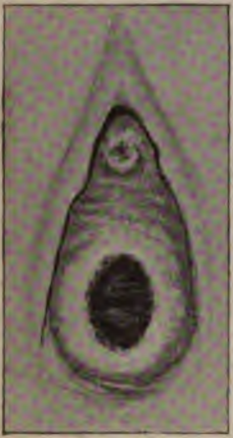


FIG. 97.

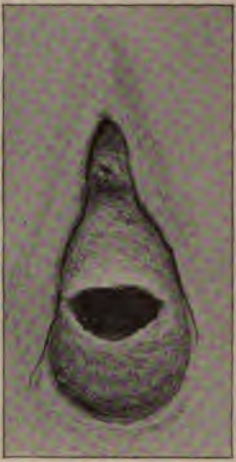


FIG. 98.

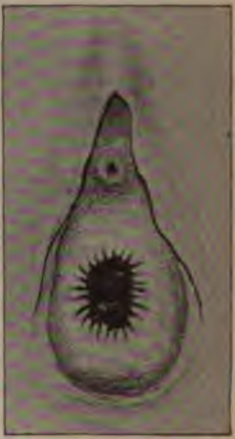


FIG. 99.

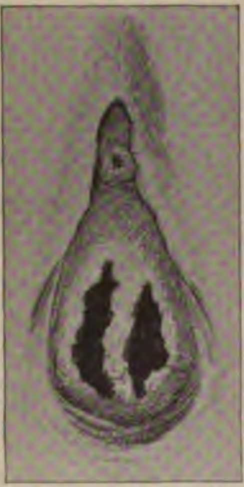
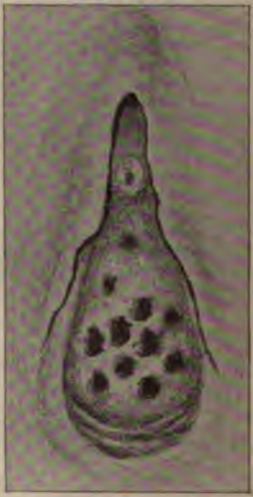


FIG. 100.



Varieties of Hymen.

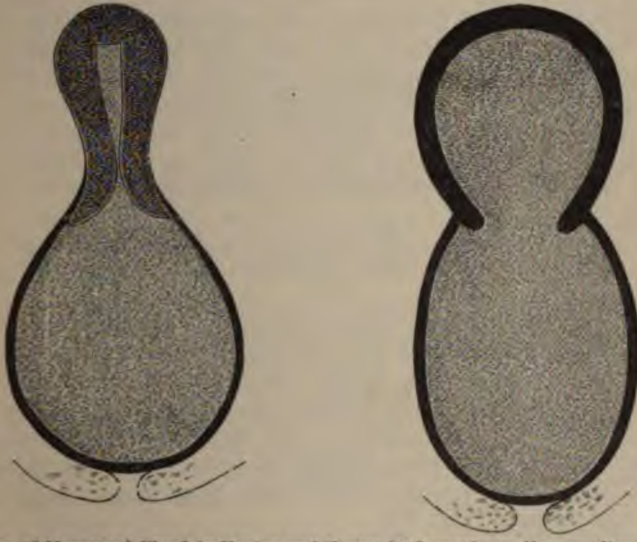
Muscular fibres, nerves, and blood-vessels are found in the hymen, and usually its rupture is attended by pain and a certain amount of bleeding.

Malformations.

1. *Absence of the Hymen.*—The hymen may be entirely wanting or only a trace of it be present, even though the remainder of the genital organs are perfectly normal.

2. *Imperforate Hymen.*—The hymen may be congenitally imperforate, the child being born without the usual hymeneal opening. This is of no consequence until the menstrual function begins, when of course the escape of the monthly discharge of blood cannot take place. The girl has the symptoms of menstruation every four weeks, but no blood is seen. She complains of increasing pain with each monthly return, and gradually the abdomen begins to enlarge. Usually by this time the attention of the mother is called to the sufferings of her daughter, and a physician is consulted. If the symptoms of menstruation have persisted for several months, probably enough blood will have accumulated not only to distend the uterus, but also the vagina, and to cause a bulging of the imperforate hymeneal membrane. The diagnosis is very easily made by the history, the symptoms, and the subjective signs. Above the symphysis pubis will be found a globular, tense, very slightly fluctuating body, corresponding in outline to the distended uterus, and a more or less distinct wave of fluctuation will be transmitted from the fundus uteri to the protruding surface at the vaginal orifice. The treatment is obvious, and consists in making an incision into the imperforate membrane, so as to allow of the escape of the retained blood.

FIG. 101. FIG. 102.



Retention of Menstrual Blood in Vagina and Uterus by Imperforate Hymen (diagrammatic).

Authorities differ as to whether it is best to make a large opening and permit the blood to escape rapidly and freely, or a small incision which will permit only a gradual discharge of the retained fluid. The reason for making a small opening is that it was feared that a sudden discharge of the blood would not permit the uterus to contract gradually, but might excite sudden contraction, which would force the blood through the Fallopian tubes into the peritoneal cavity. This fear, however, is, in our opinion, not well grounded, since under our modern methods of antisepsis it has been found perfectly safe to make a large incision, or indeed excise enough of the hymen to permit the blood to escape rapidly. The whole genital tract is then carefully irrigated with a solution of 1 : 10,000 bichloride, and the usual bichloride gauze dressing applied over the vulva. The uterus generally contracts rapidly enough to ensure against any septic absorption. Of course it is important to prevent the admission of air into the uterine cavity, and therefore digital or specular examinations should be avoided at the time of, or soon after, the operation. An ice-bag should be kept on the abdomen for several days after the evacuation. If a distended tube has been discovered on bimanual palpation, it is well to evacuate the uterine contents slowly in order to prevent a possible rupture of the tube, which might be caused by forcible contractions of the uterus, hoping that the blood in the tube will gradually follow that escaping from the uterine cavity proper. In any case it is well to avoid hastening the escape of the blood by compressing or rubbing the uterus through the abdominal walls.

3. *Unyielding Hymen.*—The hymen may be so fleshy and so tense that it resists rupture even after prolonged and repeated attempts at sexual intercourse.

4. *Hymen with Double Opening.*—The hymeneal opening may be divided into two sections by a band of tissue extending from the centre of the upper margin to the lower. Probably this band is but the remains of the lower septum of Müller's ducts, which was not absorbed, as was the remainder of the septum. We have seen several such cases, which came under our notice chiefly on account of the obstacle to coition formed by the central band, which, after double ligation, was removed with scissors (Fig. 99).

5. *Fimbriated Hymen.*—Instead of having the usual smooth border, the hymeneal opening may be surrounded by a well-marked fringe, the so-called hymen fimbriatus (Fig. 98).

6. *Distensible Hymen.*—A few cases are on record in which the hymen was so exceedingly distensible as to permit not only coition, but also the birth of a child at term, without rupture. Therefore, while the rupture or absence of the hymen would usually mean that either defloration or parturition had taken place, still, it must not be forgotten that the membrane may be congenitally absent, may have been torn by instrumental manipulations, by masturbation, or by the passage of some large body other than a child—namely, a tumor—through the vaginal orifice. The hymen can, therefore, not be considered absolutely without reserve to be a sign of virginity.

Injuries to the Hymen.—The hymen is usually torn during first coition, the laceration generally being situated posteriorly or to one side or the other. Unless a woman has borne a child at term, however, the flaps of the torn hymen can be readily readjusted, and it will then be found that usually none of the hymen has been actually destroyed; but after a confinement the facts are different, for then it will be found that the posterior portion of the hymen has usually completely disappeared, having been absorbed during the normal involution following childbirth, or having sloughed away in consequence of the pressure exerted upon it during that event. Schroeder first called attention to this fact, which is of some importance in determining, especially in medico-legal cases, whether a woman has borne a child or not.

Occasionally, during first coition, the physiological rupture of the hymen may produce so much hemorrhage as to place the woman's life in danger and necessitate the introduction of sutures or the application of styptics. Several such cases have come to our notice, and one instance of death from the hemorrhage is recorded by Wachsmuth.[1]

Several instances are on record in which the hymen, its normal border being unusually tense and resistant, had been torn from its attachment, remaining adherent only at one small portion. In these cases coition took place usually underneath the partly separated hymen, and was then unattended by pain; but occasionally the penis would accidentally enter the normal opening of the hymen, and great pain would of course be produced by the fruitless efforts to penetrate the orifice. These symptoms induced the patients to seek medical advice, when the cause of the dyspareunia was discovered. The treatment of course consisted in ligating and severing the small point of attachment of the hymen.

Neoplasms of the Hymen.—Two cases of cysts of the hymen are reported by Winckel of Munich, which were accidentally discovered and removed with scissors. There are really no new growths of the normal hymen on record, but the torn membrane is liable to a peculiar pathological affection which has given rise to the symptoms described under the general name of vaginismus.

Vaginismus.—By the term vaginismus is understood a painful and usually spasmodic contraction of the vaginal orifice on the slightest approach of the male organ, which more or less effectually prevents the performance of the function of coition. In many instances the cause of this spasmodic contraction is due to the presence of peculiarly and exquisitely sensitive remains of the torn hymen. These so-called carunculæ myrtiformes, instead of being quite insensitive, are so tender to the slightest touch that the muscles controlling the vaginal orifice involuntarily contract, and even prevent the entrance of the examining finger. To sight, the hymeneal caruncles may not appear either enlarged or diseased, but if they are examined microscopically after removal they will usually be found to contain an excessive number of enlarged nerve-filaments, and to be in fact neuromata.

In some other cases these hyperæsthetic caruncles are absent, and nothing is found to account for the vaginismus but an eroded and exquisitely tender vaginal orifice. In those cases where perfect coition has not yet taken place, and where the hymen is still unruptured, the membrane may be found inflamed and exquisitely tender in consequence of the repeated attempts at intromission. Finally, in perhaps the least number of instances, there are found neither acutely sensitive hymeneal caruncles nor an inflamed and eroded vaginal orifice to account for the difficulty in coition. The explanation must be that in consequence of either ineffectual or only partly effectual attempts at intercourse, or because the wife objects to the act, each attempt puts her into a condition of nervous apprehension; the mere approach of the male produces a nervous excitement, which results in an involuntary spasmodic contraction of the constrictor cunni and levator ani muscles. Then, again, there may be certain lesions of the vaginal orifice which may account for the pain and fear of intercourse. Thus, urethral caruncles, fissures of the vaginal orifice, fissure of the anus even, may be the cause of the dyspareunia.

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[1] See Mundé, "Hemorrhage from Laceration of the Hymen," *Boston Med. and Surg. Journ.*, May 14th, 1885.

The late Professor Hildebrandt of Koenigsberg described a peculiar form of vaginismus in which the obstacle was situated within the vagina, instead of at its orifice, and was due undoubtedly to a spasmodic contraction of the levator ani muscles. In this form either only partial insertion of the penis was possible, the obstruction being near the middle of the vagina, or withdrawal of the organ was temporarily prevented after completion of the act.

Treatment.—The treatment naturally will differ according to the nature and cause of the complaint. When sensitive hymeneal caruncles are found to be the cause, the only way of curing the patient is to put her under an anæsthetic and remove the caruncles with curved scissors, or, if this seems necessary, pare off the whole of the posterior half of the hymeneal membrane, and divide the superficial fibres of the bulbo-cavernosus muscles at either side of the median line to a depth sufficient to relax their tension, carrying the incisions from half an inch in the vagina to the border of the skin. This method of treatment was first instituted by J. Marion Sims, who was among the first to recognize the pathology of the disease. The vaginal orifice is then thoroughly stretched by means of a trivalve or quadrivalve speculum, and a large-sized glass tube is inserted and retained until the wound has healed. At first the tube should be removed only in order to allow the patient to pass water or when her bowels are evacuated; after the wound has healed, and until all danger of a recontraction of the vaginal orifice has passed, the tube should be worn at least an hour every day. At that time it can readily be introduced and removed by the patient herself. The wound once healed, attempts at coition should be permitted; but it is advisable at first to recommend the inunction of the orifice with a 10 per cent. cocaine ointment, or a suppository of one drachm of the same ointment may be inserted into the vagina a few moments before the expected intercourse.

When erosion of the vaginal orifice seems to be the sole cause of vaginismus, a different plan of treatment should be followed. First paint the eroded surfaces thoroughly with a solution of nitrate of silver of 20 grains to the ounce; then direct that a pledget of lint smeared with a 10 per cent. cocaine ointment be kept constantly between the labia, so as to prevent friction, and let the patient bathe the parts and irrigate the vagina two or three times a day with a tepid solution of lead-and-opium wash of the strength of about four to six tablespoonfuls to a pint of water. The nitrate-of-silver application should be repeated every third or fourth day until the redness and tenderness of the parts have entirely disappeared; then an attempt should be made to introduce as large a cylindrical speculum as the patient can bear without severe pain, this attempt being renewed with a larger size every day until one of at least two inches diameter can easily be inserted. Then a dilator as above described should be given to the patient for daily use until painless coition is practicable. The same treatment, with the exception of the dilatation, applies to the cases where the hymen is unruptured, but the vaginal orifice is eroded and tender. In aggravated cases of this kind, however, especially where the membrane is thick and has resisted attempts at rupture before, it may be necessary either to incise it in various places or to excise it entirely, and then proceed with the use of the dilator as already described.

In those cases where the vaginismus seems to depend entirely upon a nervous source, attempts should be made to overcome the fear of the patient by moral persuasion, by recommending abstinence from sexual intercourse for some time, and by using either cocaine or opium suppositories *per vaginam* before coition is attempted. Sims has found it necessary in very severe cases to give an anæsthetic and permit sexual intercourse under its influence. This, however, will probably be seldom necessary. Usually, local narcosis and dilatation as above described will result in overcoming the spasmodic contraction. We have met with several cases in which the vaginismus seemed to depend upon a spasmodic contraction of some of the lower fibres of the levator ani muscles, and have cured the cases by dividing these fibres with the knife under anæsthesia, and then proceeding with dilatation as described.

One case has recently come to our notice in which we were consulted because the husband had been unable to effect an entrance into his wife's vagina since marriage, two months before. The lady had last menstruated shortly before her wedding, and during the past month had suffered from morning nausea. An examination revealed an unruptured hymen, which admitted only the index finger, and was torn on attempting to insert two fingers. The uterus was found enlarged to the size of pregnancy at about two months, and we were obliged to admit that we had before us one of those extremely rare cases of impregnation without intromission of the penis (P. F. M.).

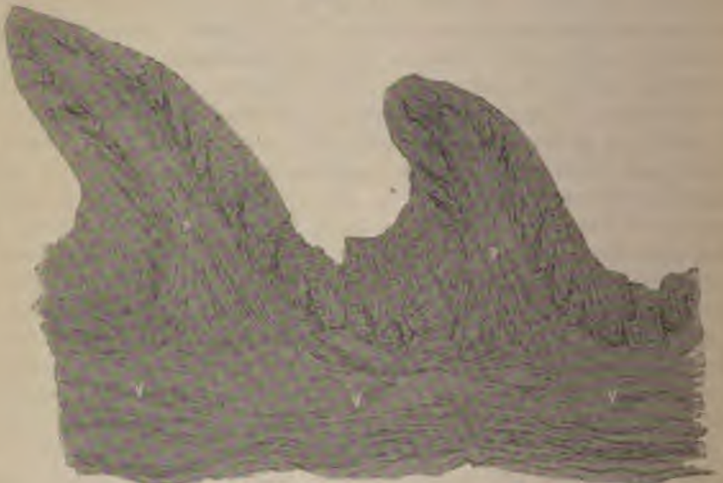
CHAPTER XIV.

VAGINITIS.

Definition and Synonyms.—The mucous membrane lining the vagina is subject to inflammatory action, which receives the name of vaginitis. It is the same disease which by certain authors has been described under the titles of blennorrhœa and blennorrhagia.

Anatomy of the Vagina.—The vagina is a canal formed of strong muscular elements and lined by mucous membrane. At its upper extremity it is attached to the cervix uteri, with which it unites at a variable point, but usually midway between the os internum and os externum. This canal consists of three coats: First, an outer coat, formed of fibrous and elastic tissue; second, a middle coat, formed of unstriped muscular fibre and fibre-cell, which are subject like the same structures in the uterus to great hypertrophy during utero-gestation; and, third, an inner coat or lining mucous membrane, composed of connective tissue and elastic fibre, and covered over with squamous epithelium. The third extends to the fourchette; the first and second spread out at the upper portion of the perineum, making the perineal septum, and attach themselves to the ischio-pubic rami. Its general form has been aptly likened, by Dr. Savage,[1] to that which would be assumed by a flexible tube if shortened to nearly half its length by a cord passed

FIG. 103.



Microscopical Section through Vagina of a Child a few days old: V, vaginal wall; Pp, papilliform projections, from the wall of which secondary processes extend, both covered with thick, plaster-like masses of epithelium (Hartnack, from Beigel).

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[1] *Op. cit.*

from end to end through one of its sides. The ridge thus formed is called the anterior column of the vagina, and marks the vesico-vaginal septum. It is about two inches long, while the posterior wall—the posterior column, as it is called—is twice that length. The anterior column, or cord which shortens the vagina, puckers its investing mucous membrane and throws it into folds or rugæ, which run transversely toward the posterior column. This mucous membrane is studded with papillæ, which are covered by pavement epithelium. The papillæ of the vagina, which were first fully described by Dr. Franz Kilian, were regarded by him as having for their function the transmission of sensation. He represents them as being thread-like and filiform.

Much discussion has occurred among anatomists as to the presence of muciparous glands between the folds of the vaginal mucous membrane, some asserting and others as positively denying their existence. The researches of Huschke, Jarjavay, Jamain, Farre, and recently of Von Preuschen, enable us to accept their existence as an undoubted fact, though they are limited, according to the last-named observer, to the upper portion of the canal. The vagina may then be said to be lined by mucous membrane which is covered by epithelium, and thrown into folds which are studded by projecting filiform papillæ, between which lie occasional muciparous follicles.

Varieties of Vaginitis.—Vaginitis assumes three forms, which differ from each other sufficiently to require separate investigation. They are denominated as follows:

Simple vaginitis;
Specific vaginitis;
Granular or papillary vaginitis.

Prof. Hildebrandt of Germany has recently described another variety, which he styles "adhesive," for the reason that its chief characteristic is to produce adhesion between the vaginal walls and the vagina and cervix. It may occupy the whole of the vagina: the mucous membrane bleeds readily; and the discharge is thick, creamy, and sanguinolent. It occurs very frequently in elderly women, and is then known as senile vaginitis.

Simple Vaginitis.

Definition.—This variety of vaginitis consists in inflammation of the mucous membrane of the vaginal canal from some cause other than gonorrhœal contagion.

Varieties.—It may exist in acute or chronic form, either of which types may appear originally or be the result one of the other. The acute form may be excited by some special cause and rapidly pass into the chronic; or, originating as a low grade of inflammation, the disease may at any time take on the characters of virulence and acuity. Two subdivisions of simple vaginitis, the recognition of which at the bedside constitutes an important point, are primary and secondary. Sometimes the disease exists as a primary lesion, but very commonly it depends upon the excoriating properties of a fluid discharged by the mucous membrane of the uterus. Under these circumstances no treatment addressed to the vaginal surface will effect a cure, for even if the disorder existing there be removed, it must inevitably return so long as the cause which originally produced it remains.

Causes.—In the great majority of instances this affection, more particularly in its chronic form, depends upon a discharge from the uterus, to which it is secondary. It may, however, arise from any of the following exciting influences:

Exposure to cold and moisture;
Injury from pessaries or coition;
Disordered blood-states, as those of phthisis and the exanthemata;
Retained and putrefying secretions;
Chemical agents;
Parturition.

After matrimony the acute form is not unfrequently excited, and in prostitutes, whose occupation involves an abuse of sexual intercourse, it is quite common.

A bit of sponge or other substance which retains the natural secretions, left in the vagina until putrefaction occurs, will often induce the affection, and three of the most virulent cases that we have ever seen were caused by contact of a solution of chromic acid with the vaginal walls in making an application to the uterus.

Pathology.—At the commencement of the disease the mucous membrane of the vagina becomes highly vascular and its arterioles are distended. There is a rapid moulting of epithelium, so that abrasions often exist, and at times follicular ulcerations and diphtheritic deposits make their appearance. Sometimes, though rarely, the epithelial lining of the vagina is thrown off entire, constituting a cast or mould of the canal very similar in character to the dysmenorrhœal membrane which is occasionally expelled from the uterus.

In very severe cases the inflammatory action passes down into the submucous tissues, and a true phlegmonous process is established which may result in abscess. For a period varying from fifteen to thirty hours after the inception of the disease the natural secretion of the part is checked; then pus of acrid and offensive character pours forth freely, which in a week or ten days is replaced by muco-purulent material. This discharge is found to consist of serum, large numbers of epithelial cells, pus, blood-globules, and an infusorial animalcule called the *Trichomonas vaginalis* by Donné, who first described it. By some the last has been regarded as ciliated epithelium separated from the uterus, but it is probably an animalcule which exists in vaginal mucus of unhealthy character. Donné at first regarded it as characteristic of specific vaginitis, but subsequently renounced the view.

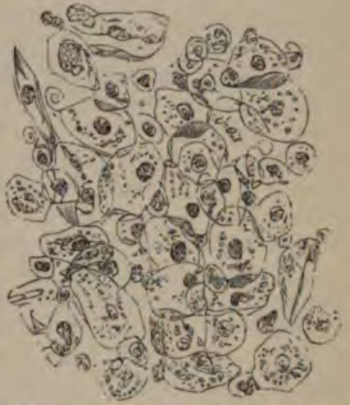
Symptoms.—Acute vaginitis manifests itself by the following symptoms:

A sense of heat and burning in the vagina;
Aching and weight at the perineum;
Frequent desire for micturition;
Profuse purulent discharge of offensive character;
Violent pelvic pain and throbbing;
Excoriation of the parts around the vulva.

In the chronic form the disease shows the same symptoms, though with much less severity. In very mild cases only a slight itching or burning sensation is experienced, with discharge of the leucorrhœal matter.

Physical Signs.—When the inflammation is acute the labia are found swollen and tense, the mucous membrane of the vaginal canal red and covered with pus, and the animal heat very much increased. Introduction of the finger produces great pain, and often cannot be tolerated. As the labia are separated a flow of fetid muco-pus is discharged. If the canal be explored by means of the speculum, its surface will be found congested, while at numerous points abrasions, and perhaps follicular ulcerations, will be noticed. The inflammatory appearances of the vagina will be seen to have extended to the cervix uteri, and very generally from the os will be found to hang a plug of mucus secreted by the irritated, or even inflamed, Nabothian follicles.

FIG. 104.



Epithelium in all Stages of Development in Simple Vaginitis. 220 diameters (T. Smith).

Prognosis.—In its acute form it usually runs its course in about two weeks. In the chronic form it lasts for an indefinite time, often subsiding into ordinary vaginal leucorrhœa, or rather into a state of which this is the only prominent symptom.

Differentiation.—Simple vaginitis may be confounded with

Gonorrhœa;
Endometritis;
Pelvic abscess.

From the first the differentiation is always difficult and frequently impossible. The means by which it may sometimes be accomplished will be mentioned in the article relating to Specific Vaginitis. From the two remaining affections it is readily distinguishable by the speculum and vaginal touch. An error will be committed only when the practitioner is not mindful of the possibility of its occurrence, and draws his conclusions from insufficient data. We have seen two cases of profuse and obstinate vaginal discharge regarded as the result of vaginitis which were in reality produced by pelvic abscesses that emptied their contents into the upper part of the canal. An element in such cases calculated to mislead a superficial examiner is the fact that vaginitis does really exist to a limited extent as a result of the purulent flow from the abscess. This remark likewise holds true in reference to endometritis and catarrhal erosion of the cervix.

Complications.—Vaginitis sometimes produces violent urethritis, and less frequently, spreading upward, contrary to the rule, results in endometritis, salpingitis, and pelvic peritonitis.

Specific Vaginitis, or Gonorrhœa.

Definition.—This variety of the affection consists in inflammation of the vulva, vagina, and urethra, arising from a specific contagion which is transmitted by a yellow purulent discharge.

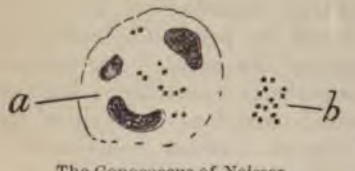
Pathology.—The purulent material which is the contagious element, after remaining for some time in contact with the vaginal walls, excites in their investing mucous membrane an active hyperæmia which results in heat, swelling, pain, and an ichorous and abundant purulent secretion. This inflammation may be simulated by simple acute vaginitis, but its most characteristic features are usually excited by the contagious influence just alluded to. The disease may affect all the localities above mentioned at the same time, but very often it is limited to the upper part of the vagina, to the vulva, or to the urethra. In some cases it is for a length of time concealed in the vaginal cul-de-sac, no other part of the vagina being affected. This fact explains how women apparently healthy transmit gonorrhœa.

Causes.—As there is but one cause for scarlet fever, for measles, and for variola—namely, absorption of a specific poison or contagious material—so is there, it appears to us, but one cause for gonorrhœa. It is true that simple acute vaginitis may simulate gonorrhœa so closely that the most experienced observer will be foiled in diagnosis, but this fact does not prove the diseases to be identical. The poison of gonorrhœa produces inflammatory results as a certain consequence of contact; the causes of acute vaginitis produce them as an accident which probably in a different state of the patient's system would not have occurred.

Symptoms.—The symptoms of this variety of vaginitis differ very little, indeed in many cases not at all, from those of the simple acute form. If anything, the difference consists merely in an increased severity of the symptoms mentioned for the simple variety.

Physical Signs.—The vulva, vagina, and urethra will be found swollen, tense, red, and hot. In the beginning they are unnaturally dry, but very soon a profuse secretion bathes them with a creamy pus, sometimes streaked with blood. Should the affection have exerted its influence chiefly upon the vulva, pruritus, excoriation, and intense heat will be observed. Should the urethra be chiefly or solely diseased, instances of which are recorded by Ricord and Cullerier, the most violent scalding upon the passage of urine will especially annoy the patient.

FIG. 105.



The Gonococcus of Neisser.
a, within pus-corpuscle;
b, outside pus-corpuscle (free).

Differentiation.—It will be seen, from what has been already stated, that the differentiation of this disease from simple acute vaginitis must be extremely difficult. In many cases it is impossible, for there are no signs which can be regarded as positively conclusive. The *Trichomonas vaginalis*, once supposed by Donné to be pathognomonic of specific vaginitis, is now known to exist in the pus of that which is simple; and urethritis, formerly viewed as diagnostic by many, is sometimes a complication of the simple form and is sometimes absent in the specific.

Recently, a supposed infallible diagnostic sign of gonorrhœal infection has been discovered by Neisser, who under the microscope detected a peculiar bacterium which he called the gonococcus, and which he claims exists only in this disease. There may fairly be said to be still some doubt on this subject. A positive differentiation between a severe case of acute or subacute simple vaginitis, and one caused by gonorrhœal infection can, in our opinion, seldom if ever be made.

The following are the symptoms which should lead us strongly to suspect the specific nature of a case:

Great virulence and acuity in development;
Development in a woman previously free from vaginal discharges;
Marked urethral complications;
Copious purulent discharge;
Transmission to the male from coition.

Although it is true that in many cases these symptoms will render us certain in our conclusions, in many others they will exist in cases certainly of non-specific character.

The moral character of a patient, the presence of the undisturbed hymen, and the existence of a severe endometritis, with cervical erosion, would to some extent incline us to favor a diagnosis of simple rather than specific vaginitis.

Course, Duration, and Termination.—The duration of the disease will depend in a great degree upon the character of the treatment adopted. Under a proper management even a severe case may often be cured in from two to three weeks, but if neglected it may continue for months and perhaps years. The morbid action passing up into the uterus may exist as an endometritis long after the vaginal trouble has disappeared, or it may pass into the bladder and excite cystitis, or down their narrow ducts into the vulvo-vaginal glands.

Dr. Noeggerath in 1873 published a remarkable paper on "Latent Gonorrhœa in the Female Sex,"[1] in which he declares that certain morbid phenomena in the female organs which have hitherto been considered as separate, and treated independently, possess a common basis from which they collectively and separately take their origin, this being nothing more nor less than gonorrhœa. "I have," he says, "undertaken to show that the wife of every husband who at any time of his life before marriage has contracted a gonorrhœa with very few exceptions is affected with latent gonorrhœa, which sooner or later brings its existence into view through some one of the forms of disease about to be described. . . . . I believe I do not go too far when I assert that of every one hundred wives who marry husbands who have previously had gonorrhœa, scarcely ten remain healthy; the rest suffer from it or some other of the diseases which it is the task of this paper to describe. And of the ten that are spared we can positively affirm that in some of them, through some accidental cause, the hidden mischief will sooner or later develop itself."

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[1] *Die Latente Gonorrhœ im Weiblichen Geschlecht*, Bonn.

The diseases to which this author refers as remote consequences of latent gonorrhœa are perimetric inflammations, both acute and chronic, oöphoritis, and catarrh of the genital tract. These when once excited are, he declares, incurable, and render the life of the female one of misery and danger. These women rarely become pregnant, or if they do, either miscarry or bear only one child. To sustain this assertion he gives the statistics of 81 cases, of which 31 only became pregnant. Of the 31, only 23 went to full term, 3 were prematurely delivered, and 5 aborted. Of the 23 who went to full term, 12 had one child each during married life, 7 had two children each, 3 had three, 1 had four; and among the 23 women there were 5 abortions. He asserts that, although apparently cured, gonorrhœa may exist both in male and female an entire lifetime in the latent form, which may at any moment burst forth into acute gonorrhœal inflammation or excite serious uterine or peri-uterine inflammation.

Since the appearance of these views we have considered this subject very carefully. While we admit that even years after a gonorrhœa has been considered cured some lurking infectious element, dammed up perhaps behind a stricture, may transmit the disease, we have failed to get evidence of the truth of Dr. Noeggerath's assumptions as to the universality of such transmission of disease. Were they true, indeed, it appears to us that a healthy woman would be a rare exception to a very general rule.

Complications.—The complications of gonorrhœa in the female are numerous and important. The disorder sometimes becomes an exceedingly grave one, and in some instances destroys life. It may induce the following results:

Cystitis;
Inflammation of vulvo-vaginal glands;
Endometritis;
Fallopian salpingitis;
Pelvic peritonitis.

Mr. Salmon,[1] who first drew attention to inflammation of the vulvo-vaginal glands as a result of the disease which we are considering, declares that it is quite common.

The passage of the disordered action into the uterus through the tubes, and into the peritoneum, is the most dangerous of all its consequences, and produces great risk to life from the pelvic peritonitis which it excites.

Granular or Papillary Vaginitis.

Definition and Synonyms.—This variety of vaginitis was first described by Ricord under the name of *psorolytrie.* In 1844, Deville,[2] a pupil of Ricord, described it fully, and it was subsequently treated of by Blatin, Guérin, and others under the names of papular, glandular, and granular vaginitis.

Pathology.—By these writers it was regarded as an hypertrophy of the muciparous follicies lying imbedded between the rugæ of the vagina. This hypertrophy, it was thought, was generally the result of pregnancy, though it was admitted that it might arise from simple or specific vaginitis. Many recent writers deny the existence of this variety of vaginitis, and view it only as a hypertrophy of vaginal papillæ, the result of the forms of the affection already mentioned. Thus Dr. Bumstead,[1] in speaking of granulations found in the vagina as a result of vaginitis, says: "They have been erroneously regarded by Dr. Deville as peculiar to the vaginitis of pregnant women." Scanzoni[2] and West[3] both deny its existence, and upon the same ground—viz. the fact that Mandl and Kölliker have discovered very few mucous follicles in the vaginal mucous membrane, which are scarcely sufficient, in spite of the corroborative discoveries of Huschke, Richet, Becquerel, Guérin, and Von Preuschen, to explain the granular feel and appearance of the *whole* mucous lining of the vagina in this disease. As a result of more extended experience we regard this peculiar condition merely as an inflammatory or congestive hypertrophy of the papillæ of the vaginal mucosa. The physiological hyperæmia present during pregnancy readily explains the engorgement of the vaginal papillæ in many cases. We have seen the granular condition extend even to the vulvar mucous membrane. It is exceedingly common, and indicates nothing but an

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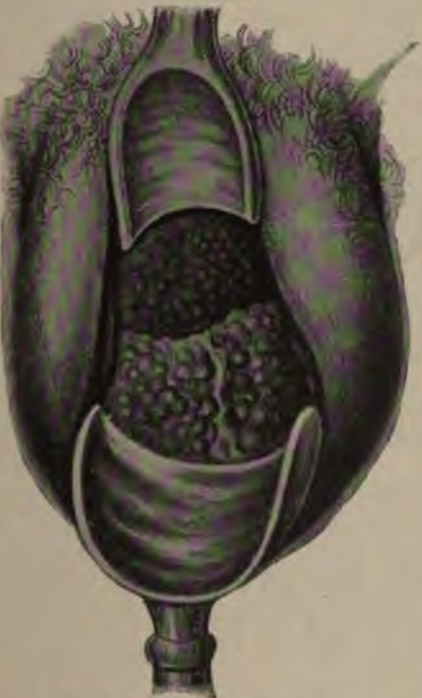
[1] Bumstead on *Venereal Dis.*, p. 172.

[2] *Archiv. de Méd.*, 4th Series, t. v.

FIG. 106.



Granular Vaginitis (Heitzmann).

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[1] *Op. cit.*

[2] *Diseases of Females*, Am. ed., p. 529.

[3] *Diseases of Women*, Eng. ed., p. 640.

aggravated or protracted vaginitis, whether simple or specific, and is by no means confined to pregnancy.

The disease is characterized by hemispherical granulations, about as large as half a millet-seed, scattered thickly over the mucous membrane of the vagina and over the cervix uteri. We once saw a case of granular vaginitis so striking in its features that the attending physician had expressed to the patient's family his fears that malignant disease was developing. He became at once convinced of his grave error when shown a description of the disease which really existed, and with which he had never before met.

Causes.—The papillary hypertrophy which gives to the disease its characteristic features and name may result directly from pregnancy, though it is frequently produced by either simple or specific vaginitis. Some women suffer from it in successive pregnancies.

Symptoms.—It demonstrates its presence by the symptoms already recorded as characteristic of simple and specific vaginitis. With these pruritus vulvæ and a lichenous eruption about the pubes are apt to appear. As parturition comes on and puts an end to pregnancy, it usually disappears, very often without any treatment whatever.

Treatment of Vaginitis.—The treatment of the various forms of this disease is so similar that it may be described under one head, modifications being suggested for those cases which have assumed a subacute or chronic aspect. If the case be one of acute character, the patient should be kept perfectly quiet in bed and locomotion and sexual intercourse strictly interdicted. Pain should be relieved by opiate or other anodyne suppositories placed in the rectum, and febrile action prevented or combated by mild, unstimulating diet and refrigerants. Every fifth or sixth hour the patient, placing under the buttocks a bed-pan, upon which she lies, and between the thighs a vessel of warm water, should by means of a syringe throw a steady stream against the cervix uteri for fifteen or twenty minutes, or even for a longer time. The methods most appropriate for syringing the vagina are fully described in Chapter IV. The bowels should be kept in a lax condition by saline cathartics, and the ardor urinæ relieved by the use of alkaline diuretics. Should inflammatory action run very high and much pain be experienced, great benefit will be derived from the free administration of opium, which should be given until complete quiescence of the nervous system is accomplished.

When the severity of the symptoms has been relieved by this combination of general and local means, a small tubular or Sims's small speculum should be passed, the cervix and vaginal walls cleansed with absorbent cotton, the whole canal washed over with a solution of nitrate of silver, ℈j to ℥j of water, and a tampon of carbolized cotton covered with vaseline or cold cream applied, so as to prevent all contact of the opposing walls. This should be renewed once in every twenty-four hours until the parts have become pale and the soreness has disappeared. Then dry powders should be substituted for the caustic and vaseline, and daily or every other day the vagina should be dusted with a powder of iodoform and tannin, equal parts, retained in place by a dry tampon, until all hypersecretion has disappeared and the disease is cured.

During the acute and subacute stages, in the intervals when there is no tampon in the vagina, that canal should be freely irrigated with a tepid solution of the lead-and-opium wash, about 4 to 6 tablespoonfuls to one pint of water, and if the vulva is much eroded compresses soaked in this solution should be kept constantly applied. A case of chronic vaginitis usually requires from two to four weeks steady treatment to achieve a cure.

CHAPTER XV.

ATRESIA OF THE GENITAL TRACT, AND RETENTION WITHIN IT OF MENSTRUAL BLOOD AND OTHER FLUIDS.

Definition and Synonyms.—The term "atresia," derived from *α*, privative, and *τραω*, "I perforate," signifies an imperforate condition, and should in its strict import be limited to complete closure of an aperture or canal. Any obliteration or occlusion which is so extreme as to remove the case from the class of strictures, and yet is not complete, should be styled "stenosis." The genital canal of the female may be imperforate at the vulva, in the vagina, or in the canal of the uterus itself.

Any one of these atresiæ may act as a barrier to the escape of menstrual blood, and create a dangerous retention of that fluid, with coincident over-distension ot the vagina, uterus, and Fallopian tubes, which may become so excessive as to end in rupture, peritonitis, and death. As this is the chief relation in which they are to be considered, it seems best to study the varieties of atresia under one head.

Congenital atresia never attracts notice until puberty has arrived, and then an examination is instituted on account of non-appearance of the menstrual flow, the presence of an abdominal tumor caused by uterine or vaginal distension, or the suspicion of pregnancy, some of the prominent signs of which are present under these circumstances. Acquired atresia is suspected for the same reasons.

In general terms it may be stated that the higher up the atresia, the greater the danger arising from its existence. Thus, an atresia of the hymen is the least dangerous of all; one as high as the os internum uteri the most so. The reason for this is evident: the former has above it, for accommodation of retained fluid, the distensible vagina and cervical canal; the latter has only the uterus itself. Then, too, distension of the vagina produces less marked influence upon the Fallopian tubes than that of the uterus. Distension of the latter does not, it is now thought, cause a reflux through the tubes, but creates a species of vicarious menstruation from their walls. This gives rise to hæmatosalpinx, which so often ends in rupture of the tube that that accident should be feared as one of the most decided dangers connected with the condition.

This tubal rupture may occur in two ways: first, sudden emptying of the uterine contents creates uterine contraction, which at once extends to the muscular fibres of the tubes, and rupture is the result; or, previous peritonitis having fixed the tubes, descent of the uterus drags upon them so powerfully as to cause their rupture or laceration of the false membranes which hold them.

It must not be forgotten, however, that, although it is an exception to the rule, vaginal atresia may cause distension of the uterus and tubes by gradually dilating the uterine tract, and before every operation this effect should be considered.

Atresia of the hymen or imperforate hymen has already been considered in the preceding chapter, to which the reader is referred.

Stenosis and Atresia of the Vagina.

Like the uterus, the vagina is in fœtal life created from the approximation and amalgamation of the Müllerian ducts upon the median line. In the former a great variety of congenital malformations are the result of arrest of development of these parts. So is it also with the latter, the chief of its anomalies being double, unilateral, diminutive, and rudimentary vagina, or no vestige of it may exist. The condition which is now to engage our attention may be due to such congenital arrest of development or to accidental causes developing after adult life has been reached. This condition was well known to the ancients, but it is only during modern times that its cure has become possible, in consequence of the operation performed by Amussat, Sims, Emmet, and others.

Varieties.—There may be no trace of the canal, the ducts of Müller seeming to have failed entirely to develop; there may be a distinct fibrous cord marking the site which it should have occupied, some slight development appearing to have occurred; development may exist for some distance up the canal, failure having taken place above; or one Müllerian duct has developed in part above and another below, giving two cul-de-sacs, separated from each other by impervious tissue. The whole canal is not rarely well developed, while the hymen guards its outlet as an unyielding and completely-closed obturator membrane. The last of these vaginal atresiæ, and, fortunately, the most frequently met with, is depicted in Figs. 103 and 104.

Not only is the operation for relief in such a case much more simple than in other varieties of atresia, the uterus is usually not involved in the dilatation and the danger of trouble after operation is not so great.

Pathology.—Congenital defective development of the vagina is one of the frequent causes of this condition; besides, as a result of injury from mechanical, chemical, or pathological agencies, a vagina once fully developed may close from adhesion of its walls; its calibre may be diminished by absolute removal of its component structures in consequence of ulceration or sloughing; or the other parts of the female genital system may go on to full development, while this is arrested in its growth and remains a fibrous cord instead of a distensible canal. As a congenital malformation there may be a double vagina, with or without a double uterus. One of these vaginæ or uteri may be patulous, the other closed. In this case there will be a menstrual discharge from the open side, and retention in the other half—that is, hæmatokolpos, or hæmatometra unilateralis—according as the hymen or the external os is imperforate. The diagnosis of this condition is often difficult. Occasionally suppuration of the effused blood takes place, and we then have pyokolpos or pyometra, respectively.

Causes.—The following special causes may be enumerated as productive of it:

Impervious hymen;
Arrest of development of vagina;
Prolonged and difficult labor;
Chemical agents locally applied;
Mechanical agencies exciting inflammation;
Sloughing, the result of impaired vitality;
Syphilitic or other extensive ulcerations.

One of the cases which have come under our observation resulted from syphilis; several from prolonged labor; one from the accidental passage of a sharp bit of wood up the vagina; another from retention of the fœtal body for two hours after delivery of the head; and one from a tampon of cotton saturated with persulphate of iron. Among the causes of sloughing from impaired vital force should be especially mentioned the continued and eruptive fevers, typhus fever, scarlatina, variola, etc.; and cholera as a cause of the accident is referred to by Courty.

Symptoms.—The disorder will demonstrate its existence only by incapacitating the vaginal canal for its important functions, copulation and transmission of menstrual blood. Should it occur in one too young or too old to require such functions from the vagina, no suspicion will be aroused as to its existence. The notice of the practitioner will generally be called to the patient by amenorrhœa or by an inability to perform the act of coition. Should the menstrual hemorrhage have taken place, a large amount of blood will generally be found confined above the constricted part of the canal, and violent contractions will have demonstrated the efforts which the parts have made to expel the accumulation. Besides these, no other rational signs will show themselves, but they will be sufficient to urge upon the attendant the necessity for a physical exploration. (For a full description we refer the reader to the preceding chapter.)

Physical Signs.—The patient being placed upon the back and vaginal touch attempted, entrance of the finger into and up the vagina will be found to be impossible. Investigation will prove that this is not due to vaginismus or adhesion of the labia majora, and rectal touch will, in cases involving the vagina, usually discover that canal running up the pelvic cavity as a fibrous cord, though sometimes no trace of it will be found.

Results.—From the mere occlusion of the vagina there is no immediate or direct derangement. But in cases where menstrual blood is poured out by the vessels of the uterine mucous membrane, and is accumulated at each monthly epoch in the portion of the canal above the stricture or in the uterus, which is dilated by its retention, rupture of these organs or of the Fallopian tubes may occur; discharge from these tubes into the peritoneum may take place, and pelvic hematocele be the consequence; or the retention of the menstrual flow may produce all those nervous and cerebral symptoms so characteristic of such an occurrence.

Prognosis.—The prognosis of these cases, as regards the possibility of removal of the abnormal state, will depend upon the extent and completeness of the obliteration and destruction of tissue. The smaller the amount of vaginal tissue found by rectal touch and examination by a sound in the bladder to exist, and the more complete and extensive the adhesion of the vaginal walls, the more closely will the case resemble one of entire absence of the vagina. The prognosis as to permanent cure will greatly depend upon the patient. If she be a woman of good sense and perseverance, and keep up after operation distension by the vaginal plug, not for months, but for years, the result is often a very good and permanent one. If, on the other hand, she ignores the risk attendant upon the cessation of its use, contraction will probably recur. During the process of making a canal between the bladder and rectum one of these viscera is very apt to be cut into, or the peritoneum may be opened at the fornix vaginæ. If a dépôt of menstrual blood be reached and evacuated, death is by no means rare from septicæmia, purulent absorption, or a septic endometritis which ends in lymphangitis or in salpingitis and peritonitis.

The prognosis is greatly governed, too, by the variety of atresia with which we deal. Occlusion due to impervious hymen warrants a very favorable prognosis; that arising from accidental causes likewise; that from congenital cause in which the uterus and vagina can be distinctly discovered as existing, a less favorable one; while that due to absence of vagina and uterus, as far as clinical observation can verify the fact, a wellnigh hopeless one. In other words, the more complete the absence of vaginal tissue and that of other organs of the pelvis, the more unfavorable will be the prognosis as to recovery from surgical interference.

Should deformity of the external genitals exist, the uterus not be discoverable, and no signs of distress at menstrual epochs show themselves, it may be concluded that the case is one of absence of the vagina, and not of complete atresia. But, thanks to the boldness of Amussat, even absence of the vagina does not preclude the possibility of establishing an artificial canal. The importance of the differentiation consists in the fact that the surgeon should in such a case be doubly cautious and circumspect in his efforts and guarded in his prognosis. It may at first thought appear that in case there be no evidence of the existence of uterus or ovaries, and no inconvenience be experienced from retention of menstrual blood, it would not become necessary to resort to an operation to render the vagina pervious. But so great is the unhappiness often resulting from incapacity of the woman for the sexual act that this becomes a reason for her to demand the resources of art, and a valid ground for interference on the part of the surgeon. If no such demand is made for surgical interference, it would, in such a case as that just depicted, be an unwarrantable procedure. Not only is the patient exposed to danger without sufficient indication; she is thus exposed for the opening of a canal which has a marked tendency to close completely.

The rule with reference to operation for atresia due to congenital closure or absence of the vaginal canal itself should, it seems to us, be this: it should be resorted to (*a*) if menstrual blood be imprisoned; (*b*) if a uterus can be distinctly discovered and the patient be suffering from absence of menstruation; (*c*) if the necessity for sexual intercourse be imperative: it should be avoided unless demanded by one of these considerations.

Stenosis and Atresia of the Uterus.

Definition and Frequency.—This consists in closure of the canal of the cervix so that no fluid can escape. In its partial form, that of stenosis, it is by no means rare, but fortunately complete atresia is decidedly so.

Varieties.—Uterine atresia may be either congenital or acquired. When it is congenital it may exist at the os internum, at the os externum, or involve the whole cervical canal. Sometimes the cervix is exceedingly small, while the body is greatly distended by fluids.

When the condition is acquired, it may also be limited to one or both ora or involve the whole extent of the canal. The causes which most commonly induce it are the following:

The use of caustics;
Senile atrophy;
Sloughing after parturition;
Amputation of the uterine neck.

The first of these (chiefly solid nitrate of silver and nitric acid) is a very common cause of severe stenosis, and sometimes produces even complete atresia. At the present day the universal and reckless use of these caustics is fortunately far less common than formerly, and hence such results are not so frequently met with. The second is so very common in old age that Hennig declares that out of 100 women who had passed fifty years of age, about 28, over a quarter, suffered from it. The third and fourth are often met with as causes.

Results.—It might at first thought be supposed that uterine atresia occurring after the menopause would be, as it usually is before puberty, a matter of no moment. As a rule this is so, but there are exceptions to both rules. In the old woman a watery secretion sometimes takes place, giving rise to hydrometra; suppurative action may occur, creating pyometra; and decomposition of the imprisoned fluid gives rise very rarely to a development of air, physometra. Very rarely hydrometra is found before puberty, and hæmatometra in old women.

The evils which result from uterine atresia are—

Hæmatometra;
Hæmatosalpinx;
Hydrometra.

And the consequences of these, if they be left uninterfered with, may be—

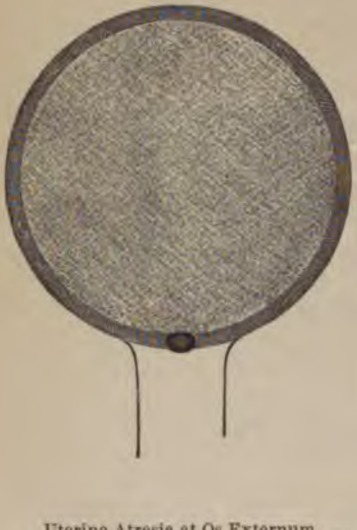
Peritonitis;
Pelvic hematocele;
Rupture of the vagina, uterus, or tubes;
Septicæmia.

Prognosis.—In a patient suffering from uterine atresia with retention of menstrual blood the prognosis is usually favorable; that is to say, if proper surgical interference is not too long delayed. With our present method of asepsis, septic infection need scarcely be feared. If the evacuation of the retained blood be delayed too long, rupture of the distended uterus or Fallopian tubes and fatal peritonitis may ensue.

In mere partial closure or stenosis of the uterine canal of course all the symptoms of retention are much less aggravated, and become apparent only when the escape of the retained fluid is less rapid than its secretion.

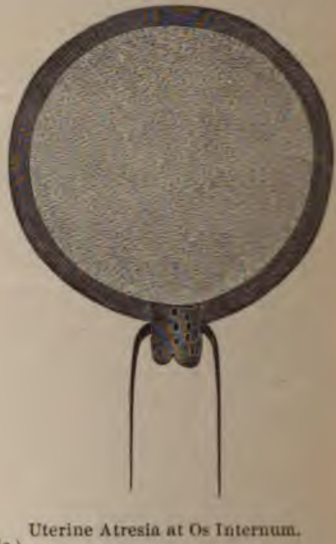
Diagnosis and Differentiation.—It is sometimes exceedingly difficult to differentiate the tumor formed by retained menstrual blood in the uterine tract from fibrous tumors, malignant growths, ovarian cysts, hematocele, and pregnancy. The rational signs which enable us to do so are these: In all but the last menstruation is commonly increased, while here it is suppressed; the tumor is surely uterine, and not ovarian, retro-uterine, or ante-uterine; it has come on slowly, and not suddenly, as the tumor of hematocele does; and at every monthly epoch an increase of inconvenience is noticeable from its presence. Physical signs yield more important results still. If an attempt be made cautiously to pass the uterine sound or probe, the cervical canal will be found to be closed. This constitutes the crucial test.

FIG. 107.



Uterine Atresia at Os Externum.

FIG. 108.



Uterine Atresia at Os Internum.

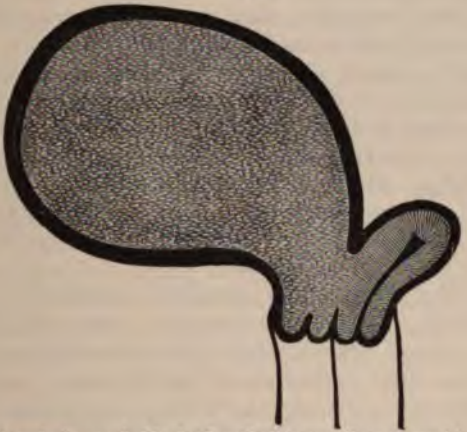
(Diagrammatic.)

The diagrams, Figs. 108 and 109, show the varieties of hæmatometra occurring in cervical atresia.

Fig. 109 presents an instance of atresia in one of the uteri in a case of double uterus, the other being free to perform all its functions.

In the last case menstruation would be regular, the uterus be susceptible of recognition by conjoined manipulation and the passage of the sound to the fundus, while one-half of the abnormally developed organ would present the large tumor seen in the diagram. Diagnosis would be possible here only by very careful conjoined manipulation.

FIG. 109.



Atresia in one-half of a Double Uterus (diagrammatic).

Treatment.—To surgery alone can we look for any hope of recovery or of safety in cases of atresia of the female genital canal. I shall treat of this part of the subject as it applies to all varieties of atresia—uterine, vaginal, and their subdivisions. It is evident that to do justice to it operative interference must be described as applying to the following cases:

1st. Where there is atresia of the hymen alone.

2d. Where the vaginal canal is closed only for a small portion of its course.

3d. Where there is complete closure or entire absence of the vagina.

4th. Where there is atresia of the uterine neck.

Where there is Atresia of the Hymen alone.—See preceding chapter.

Where the Vagina is Closed only for a Small Portion of its Course.—This deformity may be either congenital or acquired, the causes in the latter case being contractions following injuries during parturition, acute vaginitis, or senile contraction. The treatment is entirely surgical, and is practically the same as described in the next section.

Where there is Entire Closure or Absence of the Vagina.—In the first case a hard, fibrous cord will mark the position of the vagina; in the second no indication of it will be found, and a canal must be created between rectum and bladder out of a space occupied by areolar tissue.

Should accumulation of menstrual blood have occurred, the operation will prove much easier than if it has not, for its greatest difficulty consists in finding the cervix uteri, and in cases of accumulation this is an easy matter.

The other operations for atresia become insignificant when compared with this one, which requires an unusual amount of skill and caution.

Before operation, if there be any doubt as to the presence of the uterus or as to its size or position, the hand, except the thumb, may be introduced into the rectum after stretching the sphincter, and a full and satisfactory exploration made.

If on account of great obesity it be found impossible to appreciate by conjoined manipulation the extent of tissue existing between the bladder and rectum, and consequently the course in which the vagina is to be opened or perhaps absolutely constructed, the urethra may be rapidly distended by sounds so as to admit the finger to the bladder. Then the index and middle fingers of the right hand being carried up the rectum, and the index of the left introduced into the bladder, this important point may be ascertained.

Before operating, the patient should be anæsthetized and the bladder and rectum emptied of their contents. She should be placed in the lithotomy position upon a table before a good light, and the operator should have four assistants at his disposal.

Formerly the operation was performed by two methods—that of Dupuytren (1818), which consists of breaking a passage by the finger, cutting obstructions which cannot thus be overcome, and syringing out the cavity afterward, the whole operation being finished at one sitting; and that of Amussat (1832), which consists of working with the finger and dull instruments, overcoming resistance by pressure rather than by incision, and completing the operation not in one, but in several sittings.

At present we perform the operation for incomplete or complete atresia of the vaginal canal in the following manner, finishing it with ease in one sitting: The patient, being thoroughly anæsthetized, is placed in the lithotomy position, and the surgeon makes with a bistoury or sharp-pointed scissors a transverse incision into the presenting portion of the recto-vaginal septum, with a sound in the bladder and the index finger of his left hand in the rectum as a guard against wounding either of these viscera. The index of the right hand, aided by the scalpel handle or the closed points of the blunt scissors, gradually forces its way through the obstruction and separates the rectal from the vesical wall, in this way forming a new vaginal canal. If the constriction is but a partial one, the finger will soon reach the pervious portion of the vagina, and at its upper end will encounter the normal cervix uteri. If, however, the atresia is total—whether congenital or acquired matters not—the region of the vaginal cul-de-sac may be reached without the finger of the operator being able to distinguish the cervix; only a careful examination, aided perhaps by a specular inspection, may in such cases enable the operator to discover the cervix and the external orifice of the uterine canal. The danger of wounding either the bladder or the rectum is very great during this operation, and therefore the use of cutting instruments should be avoided as much as possible. A vaginal canal as nearly like in proportion to that of the adult woman having been formed, precautions must be taken against its contracting and closing again, which occurrence is more than likely to take place even if the most stringent care is observed. In order to avoid the closure of the external os, we have found it necessary several times to unite the wall of the vaginal cul-de-sac to the mucous membrane of the cervical canal by interrupted catgut sutures, and to keep a hard-rubber plug in the uterine canal for some weeks. In any case of vaginal atresia operated upon by this method it is absolutely imperative to prevent its recontraction by introducing into the vagina a closed tube of hard rubber or glass, a so-called vaginal plug, of a dimension corresponding to the size of the normal adult vagina, which, must be worn for a number of months more or less permanently—after a while at least several hours each day—until the danger of contraction has disappeared. We have already referred to this treatment in the chapter on Vaginismus.

There is usually some oozing during and following this operation, which is easily arrested by either the plug or by packing the new-formed passage temporarily with iodoform gauze, on the removal of which, five or six days after the operation, the vaginal plug may be inserted. If carefully performed the operation is unattended by danger. This operation can usually be performed in one-half to one hour, and is not especially difficult in the hands of a surgeon of ordinary skill and caution.

One note of warning should be heeded; and that is, that unless the new-formed canal is kept patulous by the daily use of the vaginal plug above mentioned for at least a year, it will inevitably reclose. This statement may be somewhat modified in cases where the woman is married and enjoying marital relations.

Where there is Atresia of the Uterine Neck.—The operator should decide by careful conjoined manipulation as to the degree of uterine distension which exists above the cervical closure.

Having decided that it is wise or necessary to empty the uterus of the retained secretions, the operation may be performed under careful antiseptic and antiphlogistic precautions without unnecessary delay. The patient is anæsthetized, placed in the Sims position, the speculum is introduced, the vagina is thoroughly irrigated with a 1 : 10,000 bichloride solution, and an aspirator needle is then introduced through the spot corresponding to the obliterated external os, in the direction of the uterine cavity as previously ascertained by bimanual palpation. When the withdrawal of the piston shows by the flow of thick dark blood that the uterine cavity has been properly entered, a fine, sharp-pointed, straight bistoury is passed alongside of the aspirator needle, and by means of several superficial incisions the cervical canal is opened sufficiently to allow of the free escape of the retained blood. A steel two-branched dilator (one of the Ellinger pattern) is then introduced through the open canal and gently separated, so as to thoroughly stretch the passage. When the blood has escaped, the uterine cavity is gently washed out with a 1 : 10,000 bichloride solution, and a strip of iodoform gauze is passed up into the cavity to afford a ready means of aseptic drainage. The vulva is covered by a pad of bichloride gauze and an ice-bag applied over the abdomen. The patient is put to bed, and kept there for several days until all danger of inflammatory reaction has disappeared. The iodoform gauze is removed after two or three days, the vaginal cavity is again irrigated, this time with a 2 per cent. carbolized solution, and the gauze is replaced in order to ensure the patulousness of the canal. As soon as the uterus has contracted thoroughly and the discharge has ceased, a perforated hard-rubber or metal plug may be inserted into its canal in order to allow such secretions as may form to escape and prevent a return of the former contraction. The regurgitation of the retained blood into the Fallopian tubes in consequence of a rapid evacuation of the uterus need not be feared, as it formerly was.

If menstrual blood has been imprisoned above the strictured portion of the vagina, the canal should, for a fornight after operation, be kept scrupulously clean by injections of tepid water practised twice a day. If the uterus and tubes have been distended by retained fluid, the cavity of the former should, just after the operation, be carefully washed out with tepid water very slightly impregnated with carbolic acid, tincture of iodine, or Labarraque's solution of soda, as advised by Courty. The patient should then be kept as quiet as possible in the recumbent posture and slightly under the influence of opium.

The period at which operation should be resorted to for congenital atresia is a subject of importance. Velpeau advocated operating in infancy, but all modern surgeons consider the approach of menstruation as a more appropriate time. Indeed, the symptoms which first call attention to the anomaly are scarcely ever observed until the period of puberty has been reached. In adult life, especially in married women, the deformity should be remedied as soon as discovered. Should the menopause have arrived, no operation will be called for unless hydrometra exist or marital relations demand it.

It should not be forgotten that delay in interference is often very disastrous during the period of menstrual activity, for lives have in numerous instances been destroyed by rupture of the Fallopian tubes, and even of the uterus itself, as seen by Peusch. This observer drew his conclusions from 258 cases of atresia, in 18 of which rupture of the Fallopian tubes from distension by menstrual blood occurred. In one instance of atresia we saw an hematocele the size of an infant's head result from discharge of blood from the tubes into the peritoneal cavity. It is possible that the mental emotion of the patient and her struggles during the operation may account for the escape of blood into the peritoneum, as noted by Bernutz. Hence, every effort should be made to avoid these by complete anæsthesia, and care should be taken not to allow of pressure upon the uterus, either intentional or accidental.

In cases in which vaginal and uterine atresia have existed together, and the uterus only is distended by blood, there can be no good reason urged for not completing the removal of both atresiæ at one sitting. It is perfectly practicable to secure complete liberation of the uterine neck and perviousness of the vaginal canal at the same sitting, without danger to the patient or a risk of failure in the operation. The excessive caution which was perfectly proper before the days of antisepsis need now no longer be observed if the rules governing the surgical practice of the present day are strictly carried out.

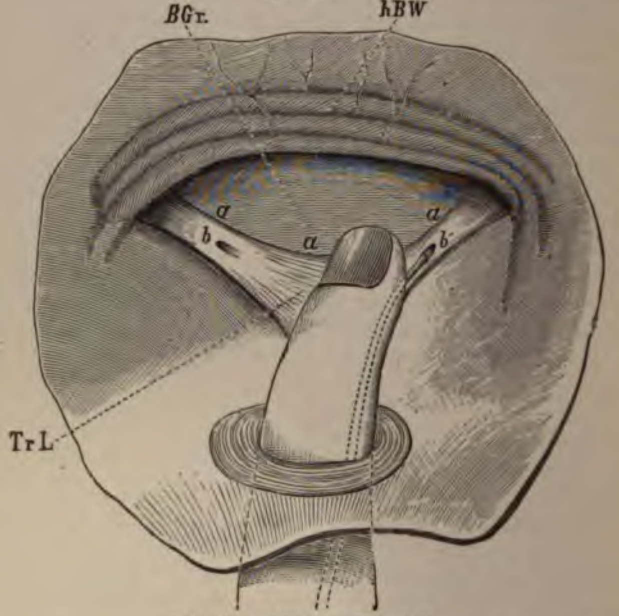
Vaginal Cysts.—Partly as results of embryonal malformation (persistence of Gärtner's ducts or the continuation of the ureters), and partly by occlusion of some of the muciparous follicles, occurring chiefly in the upper portion of the vagina, we find not very unfrequently cysts of the size of an almond to a lemon, with more or less tense walls and limpid somewhat viscid contents, in different parts of the vagina. If they are remnants of Gärtner's ducts, they are situated in the lower part of the anterior vaginal wall; if dilated follicles, they occur in the vaginal vault. At times we believe they may be very much distended cervical glands which have gradually dissected up the mucous membrane covering the cervix and encroached on the vaginal wall. They are of no consequence, except that those in the anterior vaginal wall may simulate cystocele. To cure them it is merely necessary to incise them thoroughly, scrape their cavities with the sharp curette, and pack them with iodoform gauze until healed.

CHAPTER XVI.

DISEASES OF THE FEMALE URETHRA, BLADDER, AND URETERS.

Examination.—The meatus urinarius may be examined by inspection. In order to expose the first part of the urethra, the lips of the meatus may be separated by the fingers or an ordinary dressing-forceps, or a steel two-branched dilator may be passed into the canal and gently separated, or a urethral speculum specially devised for the purpose may be employed, by means of which the walls of the canal can be exposed nearly to the neck of the bladder. Such urethral specula have been devised by Stein and others. To examine the interior of the bladder, either the finger, a sound, a speculum, or so-called endoscope can be employed. In order to introduce the finger into the bladder, the urethra and vesical neck must first be gently dilated by means of either graduated steel or hard-rubber sounds (a set of which was devised by the late Prof. Simon of Heidelberg); and when once the urethra is so dilated that the little finger can be passed into the bladder, it may be followed at once by the index finger, care being taken to avoid force which might lacerate the walls of the urethra. With the little or the index finger in the bladder a very fair palpation of its walls may be made, especially if the organ is pushed toward the examining finger by means of a finger of the other hand in the vagina or by the other hand on the abdomen. To permit an ocular inspection of the interior of the bladder we may employ endoscopes devised by Winckel, Skene, and, best of all, by Nitze, which latter has perfected a most ingenious apparatus for exposing the interior of the bladder by means of electric light. Of course the area revealed by such an endoscope must be very small, and the instrument is therefore useful only in detecting either the orifices of the ureters or certain ulcerated spots on the mucous membrane. Pawlik, late of Vienna and now of Prague, and, following in his lead, H. A. Kelly of Baltimore, not to mention various others, have practised a catheterization of the female ureters by means of stiff hollow tubes introduced through the urethra, which they guided into the ureteral orifices with the assistance of the vaginal touch. This manœuvre, it will be readily understood, requires a considerable amount of practice, and we dare say is not always successful even in the hands of its originator. Its object is chiefly to obtain urine from one ureter and one kidney alone as a means of settling the question as to which side is diseased in cases of doubtful pyelonephritis, and also in order to decide whether the one ureter or the other is obstructed by a suspected impacted stone.

Fig. 110.



Palpation of Ureters (Winckel).

TrL, ligamentum trigonale; *BGr*, fundus of bladder; *hBW*, posterior wall of bladder; *b*, *b*, openings of ureters; *a*, *a*, *a*, upper border of lig. trigonale.

Diseases of the Urethra.

Caruncles and Prolapsus of the Urethra.—Both of these conditions have already been spoken of in a previous chapter, to which we refer.

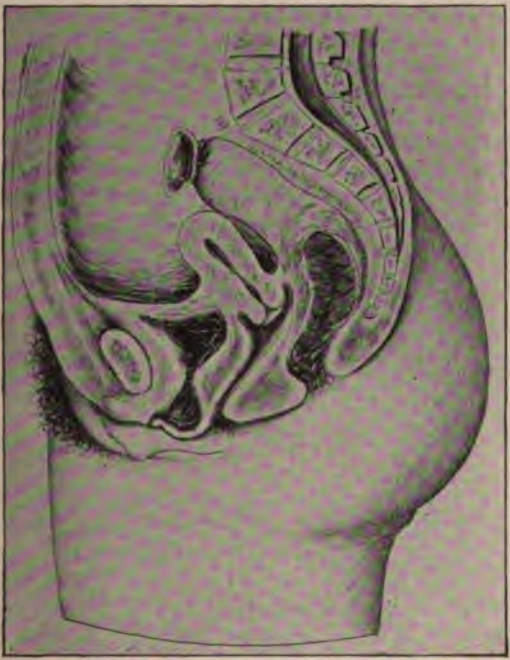
Hypospadias likewise, being a congenital malformation, has been discussed under Hermaphrodism.

Urethritis.—Urethritis in the female is by no means as common as it is in the male. If acute, it is usually produced by gonorrhœal infection. The chronic form may be either the consequence of the acute variety just mentioned, or it may be due to some irritation of long standing, such as caruncles, urethrocele, and chronic cystitis.

Treatment.—It is usually easily cured, either by removal of the cause or by the application of mild caustics and copious tepid irrigations. Skene of Brooklyn has discovered two small tubular glands running along on either side of the urethra and opening just within the meatus, which are liable to become infected by the gonorrhœal poison, and to prevent the cure of the urethritis until they are slit open and thoroughly cauterized. They are easily detected by inspection and the insertion of a fine probe.

URETHROCELE.—This condition is one to which comparatively little attention has been paid by the majority of gynecologists, only those gentlemen who were specially interested in diseases of the urinary organs in the female having studied it and mentioned it in their writings. It consists in a sacculation of the posterior wall of the urethra, which rotrudes at the vaginal orifice and simulates a minor degree of cystoele or prolapse of the anterior vaginal wall and bladder.

FIG. 111.



Urethrocele.

The differential diagnosis can easily be made by introducing the ound into the bladder, and on withdrawing it, it will be found to sink nto a pocket in the posterior wall of the urethra about midway between e neck of the bladder and the meatus.

The cause of this disease is usually a catarrh of the urethra, accompanied by relaxation of its walls and a gradual separation of some of the muscular fibres of the lowest part of the posterior wall. Little by little the urine pushes aside and downward the weakened tissues of the urethra, and a sac forms in which the urine accumulates, becomes offensive, and in its turn helps to increase the urethritis.

The symptoms complained of are those of painful, chiefly scalding, micturition, which are not relieved except when the patient pushes up the prolapsed portion of the urethra.

The treatment consists in making a small opening at the most dependent portion of the urethral pouch and sewing the mucous membrane of the urethra to the mucous membrane of the vagina by catgut sutures. Emmet, who has made a special study of this affection, calls this "buttonholing" the urethra, and excises a certain portion of the usually redundant urethral mucous membrane. Free drainage through this fistula should be maintained by means of frequent introductions of the sound and irrigation through the meatus.

[I have met with such a case in which the irritating discharge through the meatus caused the growth of caruncles which had been removed twice before by a very eminent practitioner of this city. Still they returned, and when the patient consulted me I repeated the same operation, at the same time applying strong nitric acid. Notwithstanding, the caruncles returned, and it was not until then that my attention was called to the sacculation of the urethra and to the part which it played in the reproduction of the caruncles. I then buttonholed the urethrocele, and, finding the opening very prone to close, kept it open by a fine rubber drainage-tube passed through it and the meatus and tied over the vestibule. As soon as the urethral mucous membrane regained its normal character I withdrew the drainage-tube, and the fistula closed of itself. The caruncles never returned, and the woman made a permanent recovery.—P. F. M.]

FISSURE OF THE URETHRA.—This disease usually occurs at the neck of the bladder, and manifests itself by excessively painful micturition, chiefly spasmodic contractions or tenesmus.

The diagnosis can be made only by inference or by ocular inspection.

IRRITABLE URETHRA.—Many women complain of a frequent desire to pass water, followed by tenesmus, without this symptom being distinctly referable to any pathological condition of the canal. It very commonly follows catarrh of the bladder, or it may be the result of exposure to cold or of some temporary and accidental irritation of the bladder, such as too frequent coition, intra-uterine treatment, pressure of a pessary, etc. While the disease is of no special importance and in no way serious, it nevertheless annoys its possessors very much, and they clamor for relief. It can be cured very readily by the employment of the same method which we advise for fissure of the urethra—namely, by dilating the whole urethral canal, from the meatus through the vesical neck, with dressing-forceps or some form of dilator until the little finger can be easily passed into the bladder. The application of a solution of carbolic acid and glycerin, equal parts, to the whole canal will materially aid in effecting a cure, although the urination will be painful for several days until the effects of the treatment have worn away. This dilatation may have to be repeated several times until a permanent cure is effected.

STRICTURE OF THE URETHRA.—We have found this disease very rare in the female, although Skene claims to have met with it very frequently. Dilatation by graduated sounds or Ellinger's dilator will effect a speedy cure.

Diseases of the Bladder.

CATARRH OF THE BLADDER; CYSTITIS.—*Definition.*—Catarrh of the bladder means an inflammation of the mucous membrane lining that viscus; it may be either acute or chronic.

Causes of the Acute Form.—Exposure to cold, pressure by the presenting part of the child during parturition, gonorrhœal infection, acute inflammation of the pelvic peritoneum or cellular tissue.

Causes of the Chronic Form.—Continuance of the acute variety, pressure by enlarged uterus or pelvic tumors, stone in the badder, pyelonephritis.

Symptoms.—The acute form manifests itself by sudden severe pain in the suprapubic region, a chill, and more or less high temperature, with painful micturition, and high-colored urine containing an unusually large proportion of salts. This stage may continue a few days or a week, and then gradually subside, the pain and temperature disappearing, the urine gradually becoming clear and more profuse in quantity, and recovery taking place; or it may lapse into the chronic condition, which is characterized by frequent desire to urinate, by more or less constant and annoying pressure over the region of the bladder, by cloudy rather scanty urine, which on standing deposits a sediment showing under the microscope cells of bladder epithelium—in the later stages pus-cells and shreds of connective tissue from the mucous membrane of the bladder. The specific gravity of the urine is usually between 1015 and 1020; its reaction acid, except when it has been retained some time in the bladder and has had an opportunity to become ammoniacal, when it is strongly alkaline. Patients afflicted with chronic catarrh of the bladder not only are obliged to pass water more frequently than usual during the daytime, but chiefly so at night, and in aggravated cases of the disease the poor sufferer may find herself compelled to rise fifteen or twenty times during the night, each time voiding only a very small quantity of highly irritant and offensive urine, each attempt being followed by severe tenesmus. It stands to reasón that under such a strain not only the nervous system, but also the general health and nutrition, of the patient soon give way; and we may truly say that there is no disease in all the realm of gynecological medicine which can prove more agonizing and more debilitating than a severe case of chronic cystitis.

Duration.—While acute cystitis may be cured by remedies early applied, or even cure itself, this is seldom the case with chronic cystitis. Once in a while a case of not very long standing may under favorable circumstances gradually improve and recover without any very active treatment; but the longer the duration of the disease, particularly the more the structural integrity of the mucous membrane of the bladder is affected, the more tedious will be the recovery under any form of treatment; and indeed in some cases nothing but an operation hereafter to be described will succeed in affording relief.

Prognosis—The prognosis in early cases is usually good, but the longer the disease has lasted the more likely is the inflammation to spread up along the ureters, and finally affect one or both kidneys. In addition to the catarrh of the bladder and its agonizing if not necessarily dangerous symptoms, we will then have the serious complication of purulent inflammation of the pelvis of the kidney—so-called pyelonephritis—which, if not relieved, and that usually by a counter-opening into the kidney through the lumbar region, or even by removal of the diseased organ, will sooner or later terminate fatally.

Treatment.—Acute cystitis should be treated by hot fomentations over the lower part of the abdomen, diluent drinks containing the citrate or acetate of potash and some demulcent, such as flaxseed tea or mucilage of gum arabic, warm baths, opium, and, if the fever requires it, one of the antipyretics already referred to. These agents, together with absolute rest in bed and profuse diaphoresis, will usually soon check the disease or at all events abate the acute stage. In chronic cystitis there is usually no elevation of temperature. The treatment is directed more toward changing the character of the urine, so as to render it less irritating to the interior of the bladder: if it is acid, rendering it alkaline by the use of benzoate of sodium; if it is alkaline, diluting it by the administration of citrate or acetate of potash in infusions of uva ursi, buchu, or triticum repens; further, in diluting it freely by the copious administration of the waters of some of the springs noted for their action upon the kidneys and the bladder, among which those of Wildungen in Germany, Vichy in France, and the Bethesda, Londonderry, and Buffalo Lithia waters in this country should be mentioned. A bland, unirritating diet, with the omission of salt, spices, asparagus, and spirituous and malt liquors, should be observed. In addition to this, if the urine shows very marked evidences of pus or detritus of the vesical mucous membrane, which would indicate probable ulceration of the organ, it should be freely irrigated once or twice a day by means of a soft rubber double catheter (recurrent), a pint to a quart of a tepid 1 : 1000 boracic-acid solution being thrown in at each sitting until it emerges perfectly clean, or a 2 per cent. carbolic-acid solution, or a weak (one tablespoonful to a quart) solution of chloride of sodium may be used instead. If this fails to give relief, and still the ulceration of the bladder continues, two drachms of a solution of nitrate of silver (1 drachm to 1 ounce) may be injected into the bladder with a glass syringe, being followed within five minutes by a solution of chloride of sodium of the strength above mentioned to neutralize the caustic.

This treatment may have to be repeated several times. A favorite prescription of ours is five grains of the benzoate of sodium to half an ounce of the infusion of triticum repens, buchu, or uva ursi, given every three hours. Pain should be relieved by morphine suppositories if necessary, but they should be used with great caution in order to prevent the growth of the morphine habit; and warm sitz-baths or full baths at a temperature of 100°–105° F. will be found exceedingly soothing in these cases, as well as the practice of voiding urine over a vessel containing very hot water.

If all the above remedies, after patient and persevering use, have failed to achieve lasting relief, there remains but one course at our command, and that is to remove the constant irritation of the hyperæsthetic bladder by making an opening in the vesico-vaginal septum, through which the urine can flow without intermission and the bladder have an opportunity to regain its normal condition.

Colpocystotomy.—This is a very simple operation, and requires no special preparation other than is called for in any patient to whom an anæsthetic is to be given. The patient is placed in Sims's position, his speculum introduced, and a grooved male sound passed into the bladder, by means of which the vesico-vaginal septum is put on the stretch. At the most prominent point in the median line between the neck of the bladder and the cervix uteri—that is, about halfway in the space known as trigonum vesicæ—a longitudinal incision about an inch in length is made with a curved sharp-pointed bistoury, care being taken to cut through the mucous membrane of the bladder to the same extent as that of the vagina. With catgut sutures and a rather sharply curved needle the mucous membrane of the bladder and that of the vagina are sewed together, either interrupted or a running underlooped suture being used. This is necessary in order to prevent the speedy closure of the fistula; indeed, in spite of this precaution the opening is kept patulous with great difficulty, owing to the natural tendency of such wounds to contract. The bladder is then washed out through the urethra with a mild antiseptic solution, in order to clear it of possible coagula, and if thought necessary a soft elastic catheter is passed through the fistula into the bladder in order to ensure its remaining open. The bladder should then be washed out two or three times daily through the urethra with one of the solutions above mentioned, which of course will escape through the vagina. The relief experienced from this operation is simply marvellous: from the moment of its performance we have seen patients sleep quietly, begin to eat and digest well, recover their nerve-tone, their flesh, and vitality, and rapidly change from miserable, emaciated, hysterical, and nervous women to the very reverse. Of course it is not pleasant for a woman to have urine constantly dribbling from her vagina, which, with the vulva, in course of time will become excoriated in spite of the utmost cleanliness; but this inconvenience is nothing in the minds of these poor sufferers compared to the agony which they endured before. The fistula will usually have to be kept open for from three to six months, the mucous membrane of the bladder being all the time treated in the manner indicated above until it has regained its perfectly healthy condition, when the fistula is closed in the manner described in the chapter devoted to that operation.

CONTRACTION OF THE BLADDER.—As a result of chronic cystitis, the urgent symptoms of which have slowly disappeared and the urine become normal, a gradual contraction of the calibre of the bladder at times takes place, probably in consequence of the frequent desire to empty that organ of the irritating urine. While thus all the other signs of chronic cystitis have disappeared, there still remains this one—namely, the inability of the bladder to retain more than a few ounces of urine. It is not the irritable bladder which accounts for those symptoms, as was the case during the persistence of the cystitis, but the contraction of the organ and its much-lessened calibre. Such patients are obliged to empty their bladder just as often as during the cystitis, and naturally therefore, while not suffering the same amount of pain as before, are still in a very uncomfortable position. To overcome this contraction we have followed for some years an ingenious plan—which was, we believe, first suggested by Braxton Hicks—of gradually increasing the retentive power of the bladder by accustoming it from day to day to retain a slightly increased quantity of warm water. In this manner, after a few months a bladder that would not hold more than four ounces was brought to hold sixteen to twenty before the patient found it necessary to empty it. The water was usually introduced very gently from a fountain syringe, and not by means of forcible pressure.

INCRUSTATION OF THE BLADDER.—As a result of chronic cystitis with large deposits of phosphate of lime and other salts, the mucous membrane of the bladder may become incrusted with a layer of these salts, so that the vesico-vaginal septum may on examination *per vaginam* feel almost solid. This may be said to be a preliminary stage to the formation of a vesical calculus. We have seen a number of such cases, the prominent symptoms of which were the passage of very offensive thick urine highly loaded with salts, pus, and mucus, and of course the presence of considerable pain. The worst case which we have seen we cured by means of the sharp curette, with which we scraped away at different intervals all the earthy deposits which were not washed away by the subsequent irrigation and spontaneous discharge. By means of very frequent irrigation of the bladder we rapidly restored its mucous membrane to a healthy condition, at the same time giving mineral acids and proper regimen to prevent the re-formation of the excess of salts in the urine.

STONE IN THE BLADDER.—Stone in the bladder is not so common in women as in men. Its formation undoubtedly depends upon a peculiar uric-acid diathesis which may occur even in young girls before the age of puberty. As a cause of stone in some of these subjects has been found a foreign body, such as a hairpin, a match, or a piece of lead pencil, which had been passed into the bladder for purposes of masturbation. In one case recently reported in this State a young girl of thirteen had introduced a thread spool into the vagina; this gradually ulcerated into the bladder, and there formed the nucleus for a large calculus, which was eventually removed *per vaginam* and the fistula closed.[1]

Reamy has recently reported the removal of a stone weighing 365 grains by vaginal cystotomy from a girl seven years of age. Smaller stones, if of the softer varieties, can usually be crushed by forceps or the lithotrite passed through the urethra, and the detritus washed out through the same passage, but larger calculi should certainly be removed through an incision in the vesico-vaginal septum, which can either be closed at once, or if, as is usually the case, there is cystitis present, after the cure of that disease.

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[1] Ellison, *Am. Journ. Obst.*, vol. xxii., 1889, p. 144.

To attempt to draw a stone measuring an inch in diameter through a female urethra would probably result in laceration of that canal and permanent incontinence—an accident which, according to Emmet, is not unlikely to occur even after a dilatation sufficient merely to introduce the index finger. We ourselves have often practised such an amount of dilatation, without, however, seeing any incontinence, temporary or permanent, result.

SLOUGHING OF THE MUCOUS MEMBRANE OF THE BLADDER FROM IMPACTION OF THE GRAVID RETROFLEXED UTERUS.—This very peculiar accident was, we believe, first described by Dr. Brandeis of Louisville, Ky., some twenty-five years ago. It has since been observed a number of times, and is of sufficiently frequent occurrence to justify our saying a few words about it.

The enlargement of the gravid retroflexed and impacted uterus seems to interfere with the nutrition of, and circulation in, the bladder; in consequence, gangrene of the most vascular part of the bladder, its mucous membrane, takes place, and under great pain, high fever, and after severe expulsive efforts the urethra is dilated and the exfoliated mucous lining of the organ is extruded or withdrawn by the physician. If the patient does not die from the septic infection preceding this event, she may recover, although her bladder will probably not be in a very normal condition ever afterward, as it is doubtful wheher its mucous membrane can be entirely re-formed. Our object in mentioning this rare occurrence is chiefly to let the practitioner bear it in mind if he should meet with a doubtful case of the kind.

CANCER AND OTHER NEOPLASMS OF THE BLADDER.—Cancer of the bladder is usually of the villous variety, and develops as a rule very rapidly. Still, cases have been reported where the disease existed for a number of years before terminating fatally. Thus Winckel mentions a case of his own which lasted thirteen years; Blichwinge, nineteen years; and Hutchinson, six years. Its symptoms are painful micturition and frequent discharges of bloody urine. The diagnosis can be made best by dilating the urethra and introducing the finger into the organ. Its treatment would consist in scraping away the neoplasm with the sharp curette until the bladder-wall is completely smooth. Hemorrhage may then be arrested by hot irrigation, by vaginal tamponade, and the ice-bag over the suprapubic region. A permanent cure is of course not to be expected.

Polypi of the Bladder are composed of the mucous coat, and the muscular tissue is also liable to be thickened. They have been found as large as a turkey's egg, having first made themselves known by a frequent desire to pass water. The diagnosis is of course made by the finger *per urethram*, and the treatment consists in removal, if they are of any size, through the vesico-vaginal septum.

Exstrophy of the Bladder is a congenital affection, and indicates an absence of the anterior wall of the bladder and corresponding abdominal wall, in consequence of which the interior of the bladder is exposed, so that the openings of the ureters can be seen with the urine dribbling from them. Of course only a plastic operation, by means of which the skin of the abdomen is drawn over the exposed bladder and made to replace the missing portion of that viscus, promises any cure for this deformity. If this is impossible, nothing can be done but to wear a urinal specially fitted for the case.

Ureters.

Anatomy.—As is well known, the ureters pass down on either side of the cervix uteri about an inch distant from its lateral borders, imbedded in cellular tissue, and open into the bladder at two points about one and a half inches in front of the cervix and about one inch apart. It is claimed by Pawlik, Kelly, Saenger, and some others that these tubes can in their normal condition and position nearly always be felt by the examining vaginal finger. We have often felt them in this manner, but, we confess, have more often failed to find them. They are chiefly of importance from a gynecological standpoint in their relation to the cervix uteri during the operation of complete removal of the uterus *per vaginam*, and in difficult operations for removal of adherent ovarian cysts and uterine fibroids by laparotomy, when they have not infrequently been either cut or accidentally included in sutures, in the latter instance to the very great detriment of the patient, who usually died of uræmia from retention of urine in a kidney of that side, or if she survived this danger recovered with a fistula connecting the ureter with the vagina or the external skin.

The only disease of the ureter which we propose to discuss here is the inflammation of that duct as a result of chronic cystitis. The inflamed and hypertrophied ureter can be felt passing up on either side of the cervix until beyond the reach of the vaginal finger. In such cases it is exquisitely tender to the touch, and if its topographical relations are borne in mind cannot be mistaken for anything else. Several such cases have come under our personal observation—one in which the left ureter was thus diseased, the inflammation in this instance having spread down from the pelvis of the kidney, instead of from the opposite direction. At a subsequent autopsy the diagnosis was verified, for the left ureter was found in nearly its whole extent hypertrophied to the size of the little finger.

There is of course nothing to be done directly for the diseased ureter, which is only a part of the more deep-seated disease in the kidney. Still, a recognition of the disease of the ureter would lead us in the one instance to anticipate and perhaps avert the spread of the disease of the bladder upward, and in the other instance cause us to suspect suppuration in the kidney of the affected side.

CHAPTER XVII.

FISTULÆ OF THE FEMALE GENITAL ORGANS.

Definition.—As a result of certain traumatic and morbid processes the continuity of the vaginal and uterine walls may be destroyed and communication established with adjacent viscera. To the tracts or passages thus opened the name of fistulæ has been given.

Varieties.—These communications connect the vagina or uterus with some viscus in immediate proximity, for the natural outlet of which they act vicariously, or with some neighboring part, as the peritoneum, the vulva, or the pelvic areolar tissue. Their varieties have received the following descriptive appellations:

Urinary Fistulæ:
- Vesico-vaginal fistula;
- Urethro-vaginal fistula;
- Vesico-utero-vaginal fistula;
- Vesico-uterine fistula;
- Uretero-uterine fistula;
- Uretero-vaginal fistula.

Fecal Fistulæ:
- Recto-vaginal fistula;
- Entero-vaginal fistula;
- Recto-labial fistula.

Simple Vaginal Fistulæ:
- Peritoneo-vaginal fistula;
- Perineo-vaginal fistula;
- Blind vaginal fistula.

Urinary Fistulæ.

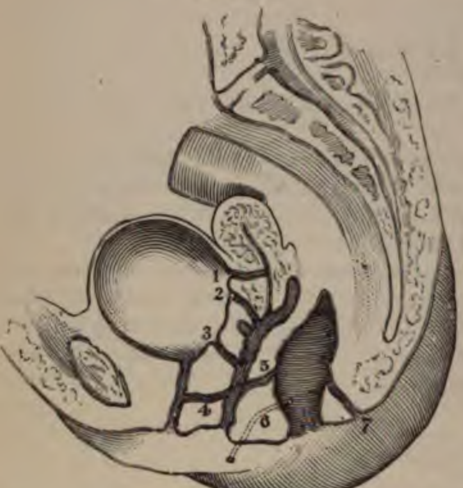
Urinary fistulæ may occur on any part of the anterior surface of the genital canal intervening between the vulva and fundus uteri. Fig. 112 displays the points at which they are usually observed.

Vesico-Vaginal Fistula (3) is a communication between the bladder and vagina, either at the trigonum or the base, which may involve only enough tissue to admit a small probe or entirely destroy the vesico-vaginal wall. Such an opening may be oval, angular, elliptical, or linear in shape, and its borders may be thick or thin, soft or indurated, rough or smooth, pale or vascular.

Urethro-Vaginal Fistula (4) resembles that just mentioned, except in the fact that the destruction of tissue which has produced it involves the wall of the urethra, and not that of the bladder.

VESICO-UTERINE FISTULÆ (1) are those in which there is a direct communication between the bladder and uterus above the point of vaginal attachment. The vagina is consequently not involved, and the urine passing into the uterus escapes at the os.

FIG. 112.



Location of Various Forms of Fistulæ: 1, vesico-uterine fistula; 2, vesico-utero-vaginal fistula; 3, vesico-vaginal fistula; 4, urethro-vaginal fistula; 5, recto-vaginal fistula; 6, recto-labial fistula; 7, fistula in ano.

VESICO-UTERO-VAGINAL FISTULÆ (2) are those in the production of which a lesion occurs in both uterus and vagina, as is imperfectly shown by 2. At the vaginal junction there is a perforation of the bladder, but this does not penetrate to the cavity of the uterus. A canal is created in its wall, and through this the urine escapes into the vagina. The last two forms of fistulæ were first accurately described by Jobert, who made of the last two varieties, superficial and deep. In the first a canal is channelled out on the vesical surface of the cervix uteri; in the second the cervix is to a greater or less extent destroyed by the process of sloughing, and through it the urine passes. In the first form the lesion is chiefly vesical and uterine, the vagina not being much injured; in the other it affects three organs, the bladder, the uterus, and the vagina. All these forms of fistulæ may thus be grouped into classes:

1st Class. Those involving the urethra;
2d Class. Those involving the base of the bladder;
3d Class. Those involving the uterus:
4th Class. Those involving the ureters.

In some cases, however, multiple fistulæ exist, and no special classification can be made.

Causes.—Any influence which is capable of destroying the continuity of the vaginal walls, either by mechanical, chemical, or vital action, would of course give rise to this condition. Those which are found in actual practice to have proved most commonly efficient are the following:

1st. Prolonged or very severe pressure;
2d. Direct injury;
3d. Ulceration or abscess.

Pressure, which is more frequently a cause than any of the others mentioned, is generally produced by the child's head remaining too long in the pelvis during labor. This is beyond doubt the most prolific source of the accident, though it may also attend a rapid labor in which the vagina has been pressed against some point of the pelvis with great violence. Such pressure produces sloughing of the part of the vagina receiving it, and at that spot a deficiency of tissue in future exists, which constitutes a fistula. The process of sloughing occurs from pressure of the fœtal head, exactly as a bed-sore takes place in one who lies for too long a time in the same position, the sequence being disturbed and retarded circulation, impaired nutrition, and local death. Or a puerperal vaginitis may be established, which runs a violent course and may end in sloughing after several weeks' duration.

An involuntary flow of urine usually announces the existence of a fistula within three or four days after delivery, though when it is the result of injury inflicted by instruments employed in delivery it may occur immediately. On the other hand, the separation of the slough, which will entail deficiency of tissue and its results, may not take place until much later, when perhaps all fears are allayed and the case is regarded as progressing favorably. Jean Louis Petit records one case developing in symptoms after a month; Jobert, one in which on the twenty-second day after delivery the slough was found at the mouth of the vagina; Adler of Iowa, one in which after twenty-nine days the slough was only partially separated; and Agnew of Philadelphia, another in which it separated on the twenty-first day.

Other agencies which may create fistulæ, but which have been rarely noticed to do so, are pessaries, stones in the bladder, fecal accumulation, etc. Recently a case was sent to us in which repeated vaginal galvano-puncture of a fibroid tumor produced a slough of the vaginal and vesical walls and a fistula, which we closed by suture after the attending physician had made three ineffectual attempts.

Direct injury may produce the accident by contusing or lacerating the vaginal walls, as may occur during delivery by the forceps or craniotomy. That these operations, when carelessly or unskilfully performed, may produce a fistula no one will pretend to deny, but there can, with the evidence now recorded, be no doubt that they have often been credited with unfortunate results which were in reality due to tardiness in their employment. Very often, where a labor has been allowed to be prolonged in the second stage until the vitality of certain points in the vagina has become irremediably impaired, and the process of sloughing has been already inaugurated, subsequent delivery by forceps or craniotomy has been regarded as producing fistula. Under such circumstances the real morbid agency, prolonged and violent pressure, is lost sight of, and the more palpable agents, the instruments employed, are viewed as the source of the accident. The truth with reference to this point should be well understood by every practitioner, for unless it be so an incompetent person may shield himself from merited blame by casting censure upon a consulting physician by whose efforts the lives of both mother and child have been saved, or a skilful operator may suffer unjustly in a suit for malpractice.

In a report upon this subject by Mr. I. Baker Brown[1] to the Obstetrical Society of London in 1863 the following statements are made: "With regard to the causes of vesico-vaginal fistula, of the 58 cases admitted into the London Surgical Home, 47 were over twenty-four hours in labor, and 39 were as much as thirty-six hours or more; 7 were two days; 16 were three days; 3 were four days; 2 were five days; 2 six days; and 1 seven days.

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[1] *Obstet. Trans.*, vol. v. p. 23.

"In the whole number of cases instruments were used in 29, exactly one-half, and in 4 only of these was the labor less than twenty-four hours; and with seven exceptions the patient had been thirty-six hours or more in labor before instruments were used.

"Of the 58 cases, in 24 only the injury happened at the first labor; in 7 at the second; in 5 at the third; in 4 at the fourth; in 6 at the fifth; in 2 at the sixth; in 5 at the eighth; in 1 at the ninth; 1 at the thirteenth; 1 at the fifteenth; and 2 not mentioned.

"From the foregoing statistics it is evident that the cause of the lesion is protracted labor, and not the use of the instruments or deformity of the pelvis.

"As a necessary deduction from what has been stated, it follows that vesico-vaginal fistula would scarcely if ever occur if a labor were not allowed to become protracted; and this is a point for the careful consideration of practitioners in midwifery."

The experience of Dr. Sims[1] is confirmatory of that of Mr. Brown. Emmet, whose authority in this matter is very high, gives the causes of 179 cases,[2] and 171 of the number originated in childbirth.

It may be said in a general way, then, that the cause of urinary fistulæ in the female is parturition, a few exceptions to the rule occurring; that protracted labor is very generally productive of them; and that the prompt use of instruments is, as a rule, preventive of them.

It is a curious fact that when, for the relief of chronic cystitis, a vesico-vaginal fistula is intentionally created by the knife, it is difficult to keep it open. In spite of the occasional introduction of the sound for this purpose, such openings obstinately heal of their own accord, so that it becomes necessary to place a species of button or stud in the opening to prevent an issue which under these circumstances is undesirable. This case seems parallel with that of perforation of the tympanum, which, being effected by an instrument, heals rapidly; while the closure of an opening, the result of disease, is usually impossible.

About thirty years ago Dieffenbach[3] recorded a case of vesico-vaginal fistula, the cause of which had been the presence of a stone in the bladder complicating labor; and Baker Brown[4] mentions another instance of this kind in 1861.

Ulceration or Abscess.—The vaginal walls may be eaten through by cancerous, syphilitic, or phagedenic ulcers, or a communication may be established by an abscess opening into the vagina and into a neighboring viscus or part. In one case we found, in the autopsy of a woman who had died from a profuse diarrhœa in which the feces had passed by the vagina, a communication created by abscess between the caput coli and that canal.

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[1] Gardner's *Notes to Scanzoni*, p. 503.

[2] *Principles and Practices of Gynecology.* The author gives in his tables 202 cases, but we subtract 23 which were intentionally produced for removal of stone and cure of cystitis. Evidently these are not admissible in the study of etiology.

[3] *Med. Record*, vol. i. 321.

[4] *Op. cit.*

Cancerous disease often destroys the vesico-vaginal septum, but as these fistula are irremediable and attend upon a rapidly fatal disorder, they attract little attention in themselves. Lastly, certain diseases producing deficiency of nutrition—as, for example, the continued fevers—may cause sloughing of the vaginal walls or phagedenic ulceration.

Symptoms.—The prominent symptoms and signs of urinary fistulæ may be grouped under three heads: first, those furnished by a characteristic discharge; second, those arising from the irritant action of such discharge upon the part over which it flows; and, third, those afforded by physical examination.

Sometimes the escape of urine is so excessive as to preclude the necessity of a discharge *per vias naturales;* at others the excretion is partly evacuated by the natural and partly by the vicarious outlet. This symptom shows at times eccentric variations. When the fistula is seated in the urethra, the bladder may be distended without loss, which may take place into the vagina during micturition. Sometimes while in the horizontal posture the escape will cease, the anterior vesical wall being pressed by the intestines against the fundus so as to close the opening; and in other cases, where the fistula is above the orifice of the ureters, the flow will take place while the patient lies, and cease when she stands.

The passage of excrementitious material through a canal and over a tissue not intended by nature to tolerate it produces inflammatory action, pruritus, eruptions, and excessive irritability. In urinary fistulæ the vulva and thighs are usually red, excoriated, and covered by a vesicular eruption. The vagina is sometimes covered by urinary concretions, and a highly offensive odor emanates from the patient's body.

The general health is very likely in time to give way, and hysteria, chlorosis, and graver disorders often show themselves.

Physical Signs.—If the fistulous orifice be a large one, even a superficial examination by touch, the patient lying upon her back, will generally serve to reveal the nature and extent of the lesion. It is different, however, with very small fistulæ, which will sometimes elude the most careful investigation. For their detection Sims's speculum should be employed, and in many cases it will be found advisable to place the woman in the knee-elbow position, instead of that on the side, before its introduction, and to have the buttocks and labia pulled apart by the hands of assistants. Even this method is not effectual in revealing the opening if it be very minute. Under these circumstances the bladder should be injected with water, and its escape into the vagina carefully watched for. Sometimes by this means a capillary opening just at the junction of the vagina and cervix will be detected. Kiwisch, Meyer, Veit, and others have used for this purpose water colored with substances which will impart a bright tinge to it. Infusion of India ink, cochineal, madder, indigo, or plain milk may be thus employed. The opening being once detected, the probe and finger will readily reveal the course, extent, and terminus of the tract.

Complications.—The complications which these fistulæ develop are vaginitis, vulvitis, stricture of urethra and vagina, and sometimes endometritis and peri-uterine inflammation. The most constant and important of these is the formation of bands which contract the vagina, and which often require severance before operative procedure can be practised.

Prognosis.—Previous to the year 1852 the prognosis of all cases in which the orifice acted as a vicarious outlet—for example, vesico-vaginal, recto-vaginal, and vesico-utero-vaginal fistulæ—was eminently unfavorable, for they very rarely undergo spontaneous recovery, and the means of cure at our command up to that time were uncertain and full of discouragement. In 1860, Dr. Sims[1] stated: "Of 261 cases of vaginal fistula (vesical and rectal), 216 have been permanently cured by the silver-wire suture, 36 are curable, and 9 incurable. Every case is curable when the operation is practicable, provided there is no constitutional vice to interfere with the powers of union. Success is the rule, failure the exception."

The enlarged experience of the profession has fully corroborated these assertions, made thirty years ago, and it may now be accepted as a true statement as to the prognosis of all fistulæ of the female genital organs, except cases of vesico-uterine fistula, in which the point of rupture is out of reach of surgical interference.

History.—The history of this subject dates back only to the sixteenth century, when attention was called to it and a plan of treatment proposed by Ambrose Paré. Before the discovery of the forceps the accident must have been one of very frequent occurrence, for then powerless labor was not under the control of the obstetrician, except by resort to a set of badly-constructed instruments for craniotomy, which in themselves presented serious dangers of laceration. The symptoms which mark its existence are so palpable and distressing that it does not require a physician to diagnosticate it, and no case of any gravity could have escaped notice. And yet, curious to relate, there are few diseases to which woman is liable which have received so little notice at the hands of the ancients. Even pelvic cellulitis and other affections, which have but lately attracted attention from the physicians of our day, are distinctly alluded to by the writers of the Greek school; but this one, so annoying, so destructive of happiness, and so urgent in its demands for relief, has received scarcely any mention. It is true that Hippocrates makes some slight allusion to involuntary discharge of urine following difficult labors, but his remarks upon the condition are meagre and unimportant.

We do not claim to have made a full examination of the writings of the Greeks and Romans with reference to the subject, but base the statement which we have advanced chiefly upon the fact that the two great compilers of their periods, Aëtius and Paulus Ægineta, make no mention of it. The work of Aëtius upon diseases of women (*Tetrabiblos IV.*) is made up of quotations from Soranus, Aspasia, Galen,

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[1] Gardner's *Notes to Scanzoni*, p. 515.

Philumenus, Archigenes, Leonidas, Rufus, Philagrius, Asclepiades—in fact, of all worthy of note whose writings were stored in the Alexandrian Library, which was the seat of his labors. By none of these is mention made of the affection. The works of Paul of Ægina, enriched as they have been by the copious notes of Dr. Adams, their translator, are equally silent; and the researches of those who have examined the writings of the Arabians record no discovery of any description of it at their hands. At any rate, it is quite certain that no contributions to the treatment of the difficulty were made by the writers of the Greek, Roman, or Arabian school.

Beginning at the seventeenth century, we allude only to those who have made some advance in treatment, and do not endeavor to record the names of all who have reported cures or advised procedures which have not been of subsequent utility.

Before proceeding with the historical sketch which ensues, we would draw the attention of the reader to two interesting facts which it will demonstrate: It will be seen that for centuries steady, persevering, and systematic efforts have been made to render this revolting malady curable, and that, as has often been the case in other great discoveries, the minds of several investigators pursued the same course until at last success was reached. After a discovery has been made it is always easy to point out the elements upon which it rests for its success, and even to follow the process of reasoning by which each in turn was supplied. There can be no doubt that the three elements necessary for successful treatment of the lesion which we are considering were—

1st. A means for exposing the fistula to view and manipulation;

2d. A suture which would remain in place without causing inflammation;

3d. A means of disposing of the urine during the process of cure.

From the time that Paré suggested a plan of treatment it will be noticed that surgeons brought these three means of cure to their aid. But they employed them separately, some using one of them, some another, and others still combining two. It was not, however, till the time of Gosset, in 1834, that the three were combined by the same operator.

In 1570, Ambrose Paré proposed the closure of vesico-vaginal fistulæ by a retinaculum. In 1660, Roonhuysen of Amsterdam used a speculum, through which he pared the edges of fistulæ and united them by a needle. In 1720, Vœlter of Wurtemberg advised a needle, needle-holder, suture by silk or hemp, and a catheter. In 1792, Fatio of Basle operated by twisted suture, placing his patients in the lithotomy position. In 1804, Dessault used a vaginal plug and catheter in the bladder. In 1812, Naegelé of Wurtemberg scarified the edges by scissors, used needles to approximate them, and employed the interrupted suture. In 1817, Schreger of Germany placed the patient on the abdomen, scarified the edges, and used interrupted suture. In 1825, Lallemand of France applied nitrate of silver to the edges of the fistula, and approximated them by a "sonde érigne" passed through the bladder, and, of 15 cases, cured 4. In 1829, Roux of

France tried twisted suture with metallic bars and ordinary thread. In 1834, Gosset of London combined the knee-elbow position, levator perinei speculum, metallic sutures, and catheter permanently kept in the bladder. In 1836, Beaumont[1] employed the quilled or clamp suture. In 1837, Jobert de Lamballe resorted to autoplasty, transplanting a piece from the labia, buttocks, or thighs. In 1838, Wutzer of Bonn placed his patients on the abdomen, pared the edges of the fistula, and approximated them by insect needles and figure-of-8 suture. To expose the fistula the perineum was held up by a hook and the labia drawn aside by assistants. In 1839 and 1840, Hayward of Boston, U. S., reported three cases cured by vivifying the edges and closing with silk suture. This surgeon introduced a notable improvement, and aided in the final success by vivifying not only the borders of the fistula, but the neighboring vaginal surfaces. In 1844, Chelius[2] placed his patients in the knee-elbow position. In 1846, Metzler[3] of Prague employed the levator perinei speculum, perforated balls the size of shot, the knee-elbow position, gilded needles, and a permanent catheter. In 1847, Mettauer of Virginia employed the catheter and leaden sutures with such success that he was led to make the following statement: "I am decidedly of the opinion that every case of vesico-vaginal fistula can be cured, and my success justifies the opinion." In 1852, Jobert de Lamballe adopted his method, styled "réunion autoplastique par glissement," which consisted in giving sufficient vaginal tissue for union by cutting transversely through the vagina at its junction with the uterus, in a line with the fistula. In 1852, Marion Sims[4] of the United States combined the three essentials for success—the speculum, the suture, and the catheter—and placed the operation at the disposal of the profession.

The discoveries to which he laid special claim were these:

1st. A method by which the vagina could be distended and explored;

2d. A suture not liable to excite inflammation or ulceration;

3d. A method of keeping the bladder empty during the process of cure.

Entering the field almost as early as Sims, Simon of Germany greatly aided in systematizing the operation, and has been second to no one else in improving it.

From a study of the literature of the subject it is made as evident as written testimony can make any history of the past that not only did several investigators combine two of these elements of success in their operations, but that two, Gosset in England, and twelve years afterward Metzler in Germany, absolutely combined all three. It is also made equally evident that they either failed to recognize the importance of what they had attained, or did not impress its value upon others so that humanity could profit by it. Dr. Gosset's procedure is thus described in his own words in the first volume of the London *Lancet*, page 346:

"Having placed the patient, resting upon her knees and elbows, upon a firm table of convenient height covered with a folded blanket, the external parts were separated as much as possible by a couple of assistants, so as to bring the fistula, which was immediately above the neck of the bladder, into view. I seized with a hook the upper part of the thickened edge of the bladder which surrounded the opening, and proceeded with a spear-shaped knife to remove an elliptical portion, which included the whole of the callous lip surrounding the fistula, the long angle of the ellipsis being transversely. This was readily effected; but in consequence of the very contracted state of the parts the next steps of the operation were with difficulty executed; and I should not have succeeded in passing the sutures had I not used needles very much curved and a needle-holder which I could disengage at pleasure, the needles being withdrawn with a pair of dissecting-forceps after the holder was removed. In this way three sutures were passed; and afterward, by twisting the wire, the incised edges were brought into contact and retained in complete apposition until they had firmly united. One of the sutures was removed at the end of the ninth day, the second at the end of the twelfth day, and the third was allowed to remain until three weeks had elapsed. After the operation the patient was put to bed and desired to lie on her face, an elastic gum catheter, having a bladder secured to its extremity for the reception of the urine, having been introduced and retained by means of tapes. She had not the slightest discharge of urine through the vagina after the operation, which completely succeeded in restoring the healthy functions of the part. The advantages of the gilt-wire suture are these: It excites but little irritation, and does not appear to induce ulceration with the same rapidity as silk or any other material with which I am acquainted; indeed, it produces scarcely any such effect, except when the parts brought together are much stretched. You can therefore keep the edges of a wound in close contact for an indefinite length of time, by which the chances of union are greatly increased. I have used it now in very many operations, as after extirpation of the breasts, tumors of various kinds, and for bringing the lips together after the removal of a cancerous growth, in all of which cases it answered extremely well."

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[1] *Med. Gaz.*, Dec. 3, 1836, p. 355.

[2] Agnew, *op. cit.*, p. 15.

[3] Schuppert on *Ves.-Vag. Fistula*, p. 41.

[4] *Amer. Journ. Med. Sci.*, 1852.

The method of Metzler was published in the Prague *Viertel Jahresschrift* for 1846 under the title of "Pathology and Treatment of Urinary and Vesico-Vaginal Fistulas, with a method of treatment easily executed and completely successful." We transcribe his article from the brochure of Dr. Schuppert, already alluded to:

"To perform the operation successfully it is of much importance to have—first, a speculum, serving as a dilator of the vagina. Such an instrument consists of a grooved conical blade, five and a half inches long, three inches wide at the anterior part, half an inch wide at the posterior. The end of the speculum is bent under at a right angle and protected with wood for the handle. The instrument is best when made of silver, and polished to reflect the light on the parts to be operated upon. Second, an apparatus consisting of perforated clamps, gilded needles, and an instrument called 'Rosenkranzwerkzeug,' consisting of perforated balls of the size of a large shot, by which the clamps are held in contact. After the patient is placed on her knees and elbows, the dilator is introduced into the vagina and given to an assistant, who in holding it presses it against the rectum. The edges of the fistula are then pared off, which may be accomplished with curved scissors. One line and a half from the mucous membrane of the vagina and half a line from the edge of the bladder have to be cut off; the needles are then applied, and the wound held in coaptation by the clamps; a female catheter is introduced into the bladder by the urethra, and the catheter fastened by a T bandage."

From what has been said thus far it would appear that Dr. Sims was forestalled in all the details of the discovery by which he has rendered vaginal fistulæ curable. To a certain extent this is unquestionably true, but only as regards the theory of the matter. Before his publications the unfortunate women whose lives were rendered miserable by fistulæ through the vaginal wall were virtually almost as hopelessly affected as they were before Gosset and Metzler appeared in the field.

Velpeau[1] in 1839 thus speaks of cure of these fistulæ: "To abrade the borders of an opening when we do not know where to grasp them; to shut it up by means of needles or thread when we have no point apparently to secure them; to act upon a movable partition placed between two cavities hidden from our sight, and upon which we can scarcely find any purchase,—seems to be calculated to have no other result than to cause unnecessary suffering to the patient." Vidal de Cassis[2] says: "I do not believe that there exists in the science of surgery a well-authenticated, complete cure of vesico-vaginal fistula." Malgaigne[3] in 1854 says: "But the truly rational method, that which at present offers the greatest facility and efficacy, and the only one which should be applied in all cases of fistula of large size, is the suture by the procedure of Jobert."

Wutzer reported the following as the statistics which he had collected:[4] "20 cases of vesico-vaginal fistula were subjected to 48 operations—among which were elytroplasty, episiorraphy, cauterization, sutures, interrupted or twisted, and both—and only 2 cured!"

This was the real state of science with reference to this *opprobrium chirurgiæ* when Marion Sims, by combining and utilizing the three essentials for success, gained it, and rendered the operation practicable for all surgeons. It must not be supposed that he availed himself of the results obtained by his predecessors. All that he attained was arrived at by hard and original labor. Indeed, no one can read his address upon "Silver Sutures in Surgery," delivered before the New York Academy of Medicine in 1857, without being struck by his want of familiarity with the antecedent literature of the subject of his discourse.

We would not be understood as claiming for America in this matter more than she really deserves—the establishment of the method of cure upon a firm and certain basis. To claim more than this would be to ignore the plain teaching of history. To France belongs the inception; to England the glory of having absolutely made the discovery, although she did not appreciate the fact; to Germany, next to America, the credit of having specially advanced and perfected reliable operative procedures. In that country to-day, by the method of Simon, success even in the gravest cases has become the rule, and failure the rare exception.

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[1] *Operative Surgery.*

[2] *Pathologie externe.*

[3] *Manual de Méd. opérat.*

[4] *Med. Record,* vol. i. p. 322.

Since the first publication of Sims's method numerous modifications of it have been put into practice both in this country and Europe, and Dr. Sims himself had in his later years altered his plan of operating very much. The principle which he demonstrated is, however, the same, and the modifications of the operation all act in developing it.

In this country the operation is commonly performed, not by specialists alone, but by practitioners in every walk of the profession, and, thanks to the extreme simplicity of Sims's procedure, it is no longer looked upon as a difficult undertaking requiring special skill and experience. In consequence of improved rules as regards the early use of the obstetric forceps, and the better obstetric education now enjoyed by the majority of our students, vesico-vaginal fistulæ are less common than formerly, and it is only in our larger gynecological clinics that any number of such operations are now performed.

Means of Obtaining a Natural Cure.—Within a few days after delivery the obstetrician is generally made aware of the existence of vesico-vaginal fistula by a steady and involuntary dripping of urine. As soon as this is evident a Sims stationary catheter should be placed in the bladder, the vagina frequently syringed out with warm water to lessen inflammatory action, and the patient kept in the abdominal decubitus, in order that a repair of the injury may be accomplished by the efforts of Nature. This is all that can be done at this time, for it is too early to resort to suture, and the lochial discharge would be interfered with by a tampon intended to aid in the cure. The operation by suture should not be undertaken before the immediate results of parturition have passed off and the fistula has assumed a permanent size and character.

Treatment.—The methods at our command for curing, or, where cure is impossible, obviating the inconveniences due to, fistula of the female urinary apparatus, are—

1st. Cauterization;
2d. Suture;
3d. Elytroplasty;
4th. Occlusion of the vagina or uterus.

Cauterization.—This once-favorite method of treating all varieties of these fistulæ has now very deservedly fallen into disuse under the influence of improved methods by suture. Malgaigne probably gives this means its proper place when he declares that it should be employed only in those cases where the fistula is scarcely perceptible. Even in such cases Sims's operation is far preferable, and cauterization should be employed only where some special circumstance, such as want of skill or of the proper instruments, forces the operator to resort to it. The performance of it is very simple. Sims's speculum being passed so as to expose the fistulous spot, its borders should be thoroughly touched with a pointed stick of nitrate of silver or the actual cautery. This should not be repeated before the slough created has separated and an opportunity been allowed for granulation to fill up the opening.

To check the flow of urine through the fistulous orifice and support the vaginal and vesical walls during the process of granulation, a small tampon of cotton, a Gariel's air-pessary, or a glass vaginal plug should be kept in the vagina, and, to prevent distension of the bladder a sigmoid or soft-rubber catheter should be permanently retained.

Suture.

Preparation of the Patient.—No operation in surgery more urgently demands a good constitutional condition as an element of success than this. Should the patient's health not be good and her blood-state be abnormal, a visit to the country, exercise, and fresh air, with vegetable and mineral tonics, will do a great deal toward avoidance of failure. At the same time, the vagina should be regularly syringed with warm water to overcome local inflammation and ensure cleanliness. Should the disorder which caused the destruction of the vaginal wall have produced as a complication cicatricial bands in the canal, these should be cut from time to time, and allowed to heal over a glass vaginal plug, and if contraction have taken place in the urethra, it should be overcome by bougies. Before the time of the operation the bowels should be thoroughly evacuated by a cathartic, and on the day of its performance very little food should be taken, for fear that the long-continued use of an anæsthetic might produce vomiting, which would tear out the sutures.

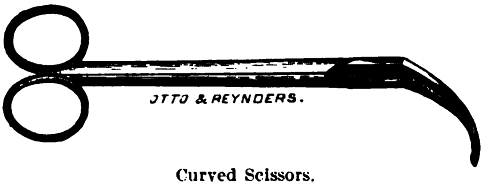
Sims's Operation.—This operation may be divided into three parts:

1st. Paring the edges of the fistula;
2d. Passing sutures through them;
3d. Approximating them and securing the sutures.

The patient is anæsthetized and placed on the operating table in Sims's position, and the fistula exposed through Sims's speculum.

The operator, having near him all the instruments, etc. which he will require, places his assistants thus: one holds the speculum, another administers the anæsthetic, and a third stands ready at his right hand to remove the blood accumulating in the vagina by means of sponges in the sponge-holders (Fig. 116), which are rapidly washed in a basin of water that stands by his side to be used again. A fourth assistant, if attainable, may be well employed in handing the instruments as they are required. All being ready, he proceeds with the first of the operation.

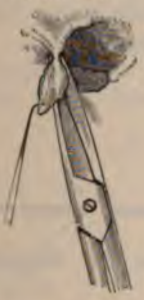
FIG. 113.



Curved Scissors.

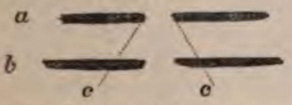
Paring of the Edges of the Fistula.—The edge of the fistula, at the point which is deemed most difficult of access and manipulation, is caught by the tenaculum, or, with what we much prefer, the tooth-forceps, shown in Fig. 77, and held up. Then with a pair of long-handled scissors (Fig. 113) or a knife a strip is cut extending from the mucous membrane of the bladder to that of the vagina, care being taken not to wound the former.

FIG. 114.



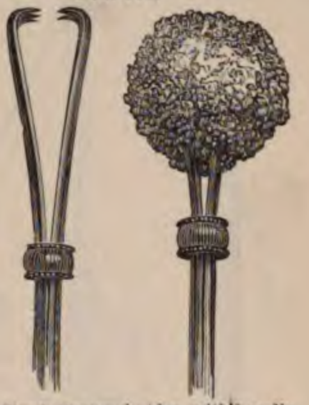
Method of Paring the Edges with Scissors.

FIG. 115.



Showing Bevelling of Edges: *a*, vesical border; *b*, vaginal border; *c c*, incision.

FIG. 116.



Sims's Sponge-holder, with handle nine inches long.

Another portion of the edge is then seized, and removed like the first. The wound thus left should be one bevelled from the vesical surface outward, and great care should be observed to remove the entire border, for upon this success depends.

It is of great moment that sufficient tissue should be removed, and that the amount taken on the vaginal surface should be greater than that near the vesical.

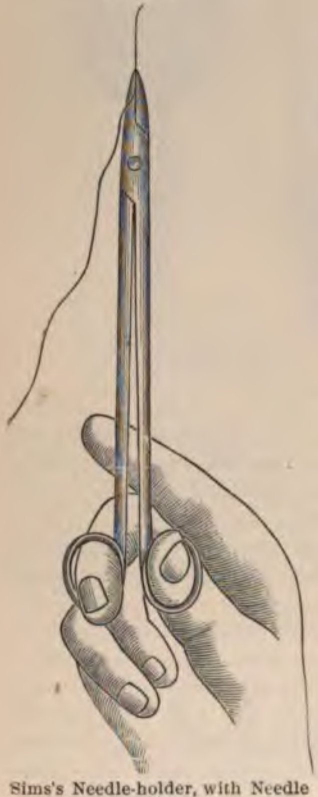
The abraded surface, from the edge of the fistula to the point of vaginal section, should measure at least four lines, or one-third of an inch, while above it should just touch the vesical border, not invading its mucous membrane. This is made evident by Fig. 115. During this part of the operation the sponges, held in long-handled sponge-holders, will have to be freely resorted to, but the bleeding generally soon ceases, and the operator may proceed to the second step.

Passing the Sutures.—The sutures are passed by means of slightly-curved needles held in a pair of strong forceps (Fig. 117) made for the purpose. In some cases the metallic thread, made of annealed silver, which is employed, may be passed at once, but usually silk threads are first passed, and the silver sutures are attached and drawn through.

The needles which we employ in the Woman's Hospital are about three-quarters of an inch long, round, slightly curved, and without cutting edges anywhere. Dr. John T. Hodgen of St. Louis has invented a needle which serves an excellent purpose. It is a very small, straight, short needle, with a point like that of a trocar. This passes readily through the tissses, and to it is attached a delicate silk thread which carries the silver wire, the bent end of which is rubbed down very small by sand-paper. The needle, held in the grasp of the needle-holder, should be passed at the angle of the wound which is most difficult of access, half an inch from the edge of the incision, and brought out at the vesical surface, but not involving its mucous lining. Fig. 118 represents the point of entrance and exit of the needle.

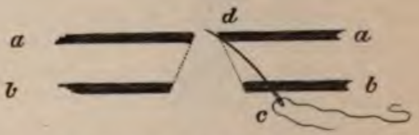
The point of the needle having passed out, it is engaged by a tenaculum or counter-pressure hook (Fig. 119) until it can be seized and drawn through by the needle-forceps. Then it is plunged into the other lip and drawn out half an inch from the edge of the incision. The ends of the silk suture are then given into the charge of the assistant holding the speculum, and another is passed in the same way at the distance of one-sixth of an inch from the first. In this way a sufficient number are passed to close the fistula.

Fig. 117.



Sims's Needle-holder, with Needle (Sims).

Fig. 118.



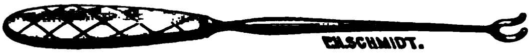
Course of the needle: *a*, vesical border; *b*, vaginal border; *c*, point of entrance of needle; *d*, point of exit of needle.

During this procedure the edge of the fistula is to be fixed by the tenaculum, and should firm, opposing force be needed to make the needles pass, it may be given by that instrument or by the counter-pressure hook shown in Fig. 119.

When the needle is seized by the forceps and pulled so as to make the thread follow it, some opposing force is needed or the thread might cut through the tissues. This force is offered by the counter-pressure hook, which is put as a fulcrum under the thread at its point of exit and made to sustain and draw it through.

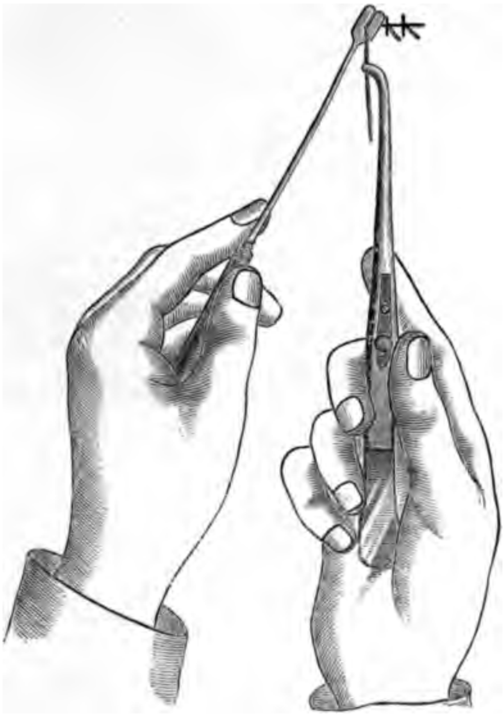
A bit of silver wire about twelve inches long is attached, by bending its extremity, to the first silk suture, and by the use of the fork just mentioned the silk thread is drawn through so as to make the wire replace it. The silk is then cut off, the silver suture put aside, and the operator proceeds to replace each silk thread in the same way. This being accomplished, the instruments are then changed in order to effect the twisting of the sutures.

FIG. 119.



Mundé's Counter-pressure Hook.

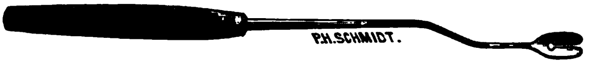
FIG. 120.



Twisting the Sutures.

The ends of the silver sutures being drawn together by the fingers and the edges of the wound carefully approximated, each thread is slightly twisted so as to keep the whole in apposition. Then the ends of the first suture are seized in the bite of the forceps, slipped into the

FIG. 121.



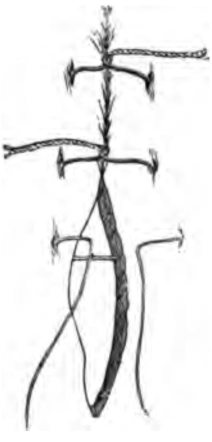
Shield for Twisting Wire Sutures.

fulcrum, and torsion is made so as to close the wound completely at this point. In this way the sutures are twisted one after the other, care being taken not to carry the torsion so far as to strangulate the tissues engaged in the constricting loop. Each suture is then clipped by a pair of scissors about half an inch from the edge of the fistula, and by means of forceps pressed flat against the vaginal wall, so as not to wound the opposite surface.

The bladder should then be syringed out to remove all blood which may have accumulated there; for if a large clot should be retained in this viscus it may cause severe vesical tenesmus, and smaller ones may block up the mouth of the catheter, which is to be kept in place permanently, and call for its repeated removal.

The patient is then placed in bed by the assistants, an opiate is administered, and a Sims's sigmoid catheter is passed into the bladder and left there. The mouth of this instrument projects beyond the vulva, so that under it a small china dish may be placed which will receive the urine as it passes through.

FIG. 122.



Shouldering Sutures.

We have been in the habit for some years of using instead a soft-rubber catheter, which we usually remove after five or six days, and thenceforth allow the patient to urinate spontaneously.

The nurse should examine the catheter every two or three hours to be certain of its perviousness and to remove the urine which collects in the receptacle placed under it.

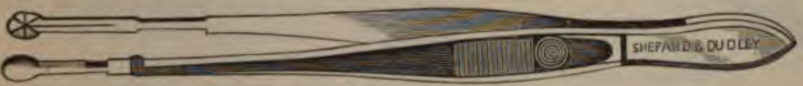
Once in every twenty-four hours the vagina should be syringed out with tepid water, or with this and white castile soap or any similar detergent; but the bladder requires no further washing than that mentioned, except in cases of vesical tenesmus. The bowels should be kept free by mild laxatives or enemas. The diet should be governed by the same rules which guide us in the management of patients under other surgical operations. It should be nutritious and unstimulating.

In from eight to fourteen days the sutures should be removed. Dr. Sims declares that "it is unnecessary to allow the wires to remain longer than the eighth day;" but others, calculating upon the innocuousness of metallic substances in the tissues, have left them longer. In two of Dr. Schuppert's cases a leaking was detected when the bladder was injected on the sixth and seventh days, which had disappeared entirely on the twelfth, when the sutures were removed, and the cure was found complete.

To accomplish the removal of the sutures the twisted end of one of them should be seized by a pair of forceps and drawn upon gently until the edge of the loop emerges from the tissues in which it has been imbedded. Then the blade of a pair of scissors should be inserted into the loop and one side cut, after which a little traction will remove the suture.

An examination may then, with great caution, be instituted to ascertain whether success or failure has attended the operation. A visual examination will generally determine this. Should there be any doubt, the bladder may be filled very cautiously with tepid water to settle the question as to the entire closure of the fistula. Sometimes one operation fails to cure, although it diminishes the size of the fistula very much, and subsequent operations must be resorted to. It may be necessary to repeat these very frequently before success is attained.

FIG. 123.



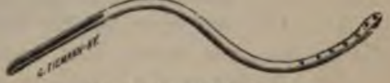
Emmet's Twisting Forceps.

The operation of Dr. Sims has been variously altered in all its steps, so that now the number of modifications is quite great—so great, indeed, that it would be out of the province of a work like this to mention them in detail. In his early operations Dr. Sims employed the quill suture, which he called the clamp suture, but a tendency on the part of the little metallic bars which he used in place of quills to produce ulceration induced him to resort to the interrupted suture.

FIG. 124.

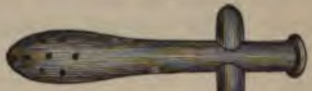
Soft-rubber Catheter.

FIG. 125.



Sims's Sigmoid Catheter.

FIG. 126.



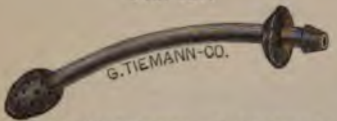
Sims's Catheter, new style.

Other methods have been successfully employed by Bozeman, Agnew, Baker Brown, Simpson, Simon, and others. For fear of being uselessly prolix we shall describe but one of these, that of Simon.

Among other attempted improvements, Dr. Startin and M. Matthieu of Paris have invented hollow needles, through which the silver threads can be passed without first passing those of silk. Extended experience with tubular needles leads us to the conviction that they are at once the most ingenious and worthless appliances which can be employed.

Simon's Operation.—No one, with the exception of Marion Sims, has labored more earnestly or achieved more for this operation than

FIG. 127.



Skene's Modification of Goodman's Self-retaining Catheter.

Prof. Gustav Simon of Heidelberg. For this reason, and in order to aid in perpetuating his memory, we reproduce his method at some length, although it is not employed in this country. The illustrations, which we reproduce from the original work, are among the best representations in existence of the different varieties of vesico-vaginal fistula and their operative cure. Succeeding Dieffenbach, Wutzer, and Metzler, who had themselves accomplished a great deal in advancing the interests of the operation by suture, he steadily labored with the means at his command, and even before he became acquainted with the improvements made by Sims had acquired a great degree of skill in treating vesico-vaginal fistulæ. To regard him as an imitator would be unjust. He was without question a coincident discoverer.

The chief features of Simon's operation are these:

1st. He repudiates silver wire as a suture superior to fine silk;

2d. He employs an exaggerated lithotomy position in place of the left lateral position;

3d. Instead of avoiding the mucous membrane of the bladder, he intentionally involves it in his abrasion;

4th. He uses no stationary catheter, and has the urine drawn only during the first twenty-four hours, and this not always.

5th. He allows the bowels to be evacuated whenever nature prompts it, and does not diet the patient nor confine her to bed. At times he even permits outdoor exercise in twenty-four hours after the operation in favorable cases.

We prefer to describe his procedure as far as possible in his own words. The following *résumé* of his method is made up from his work, *The Operation for Vesico-Vaginal Fistula*, published in 1862:

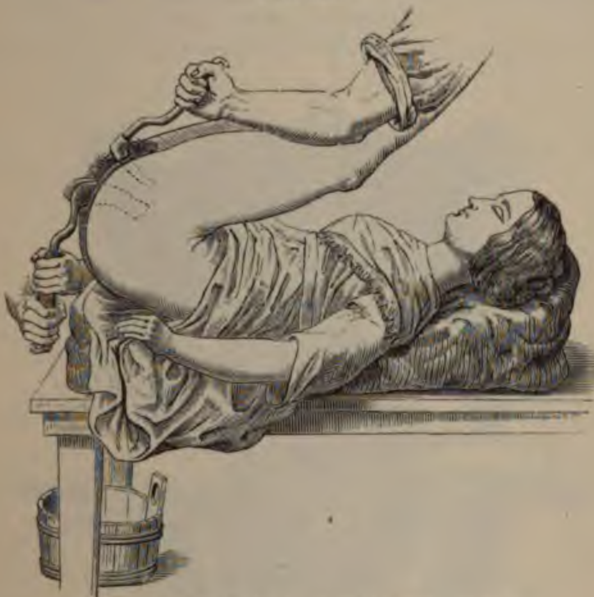
"*Position of Patient.*—There are three positions in general use for the patient in operation for vesico-vaginal fistula: (1) The back, as in operation for stone; (2) the knee-elbow; and (3) Sims's position, which is a modification of the latter. I use neither of these, but prefer the breech-back position (Steiss-rückenlage), which has all the advantages of those mentioned without their disadvantages. It consists in this, that the patient, lying on her back, is put in a position which is almost exactly similar to the knee-elbow position. The breech is so elevated that it is somewhat above the level of the abdomen and breast. The thighs are bent back toward the belly and the sides of the chest, so that the breech is the most projecting part. The legs are either flexed at the knee or extended over the sides of the chest. The vulva is above and to the front. The head is supported by a pillow. If the fistula is seated very high in the vagina, the thigh must be drawn as far as possible upward; if the fistula is, however, very near the vaginal outlet, we are not obliged to elevate the breech so much, and have no need, therefore, of flexing the thigh so forcibly. I have called this, in distinction to the ordinary back position, the

'Steiss-rückenlage,'[1] because in it the breech (Steiss) is the most projecting part, and presents itself in a manner very similar to the breech presentation of the fœtus.

"The advantages are:

"1st. The field of operation is clear; we are not obliged to operate between the thighs;

FIG. 128.



Simon's Position for Vesico-vaginal Fistula (Simon).

"2d. The assistance can all be given from the side, without hindering the operator;

"3d. It allows the use of several specula and the side retractors to expand the vagina on every side;

"4th. It is quite as well borne as the ordinary back position;

"5th. It admits of chloroform narcosis. . . . .

"If the fistula can be brought down entirely with perfect ease, I bring it directly to light. If, however, there is the least difficulty in moving it (as in the majority of cases), I operate with the specula and retractors, with the fistula *in sitû*. I always prove this by seizing the uterus with a hooked-forceps (Museux) and pulling it gently down before I operate with the specula and levers. I have improved Jobert's method of seizing the cervix with the forceps by passing two threads through the cervix, thus getting rid of an instrument which is very much in the way. Sims constructed a gutter-shaped speculum for expanding the fistula, which has left all other specula in the background. He used four sizes. It is shaped like Neugebauer's (1856), except that instead of ending in a sharp edge it is rounded out at the end. I have found the use of this speculum in many difficult cases absolutely insufficient, and in the majority of cases it only answers the purpose by the aid of other instruments to expand the vagina. I use, therefore, not this speculum alone, but also a flat-shaped speculum to hold up the other vaginal wall, and also side levers (shaped like retractors) to hold back the labia and sides of the vagina. All these instruments are fixed in long handles, curved at the end, in order to get them out of the way and to give the assistant a firm grasp.

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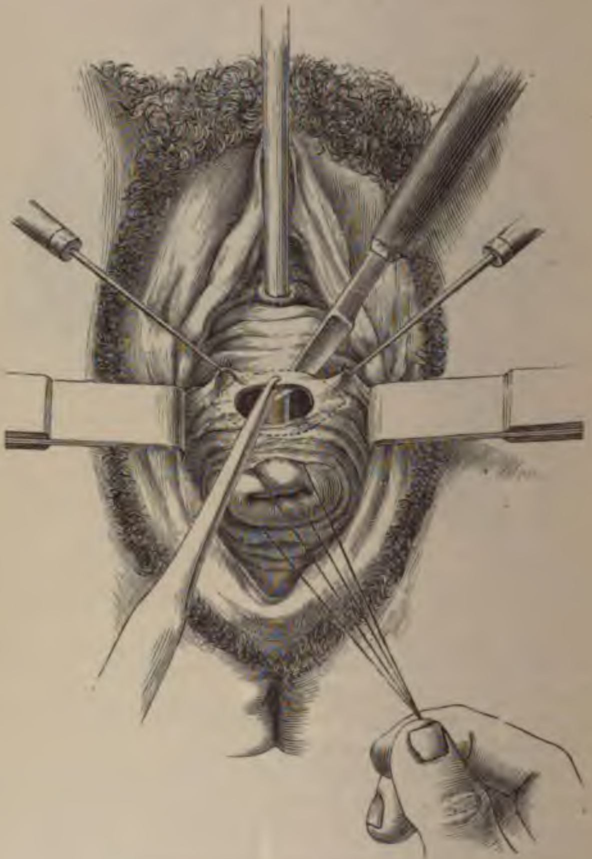
[1] Gluteo-dorsal position.

FIG. 129.



Vivifying the Edges of the Fistula (Simon).

"Always use the widest specula possible; Sims's are not wide enough. I have had two sizes more made.

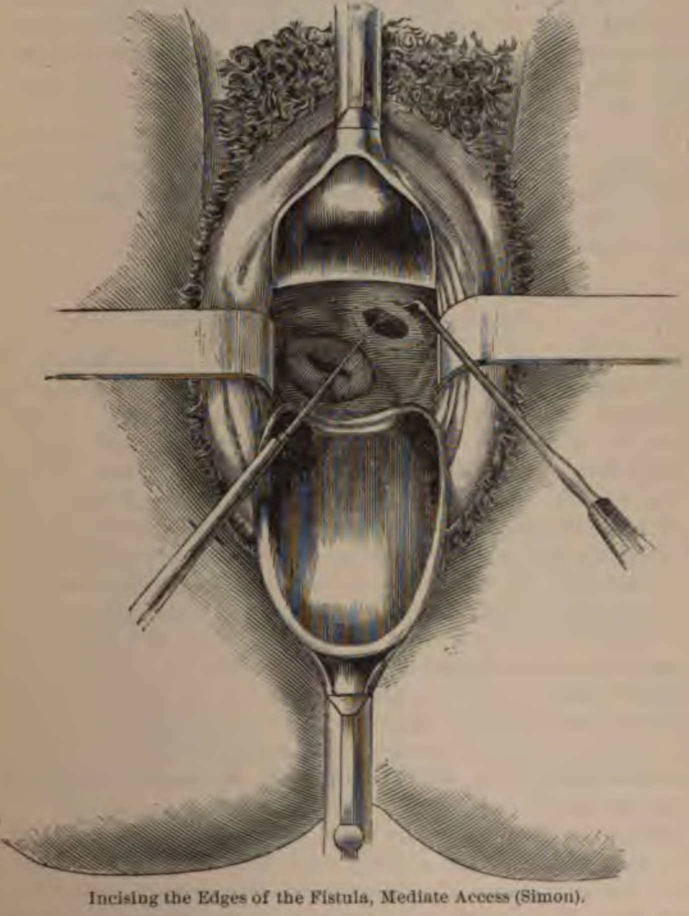
"In addition to these I often use long-handled hooks to seize the edges of the fistula. I always cut the cord-like contractions of the vagina, and have even cut the vaginal folds which were in the way.

Vivifying the Edges.—"All operators have tried to give a lar surface for union without enlarging the wound. They have done this by cutting at the expense of the vagina, leaving the edges of the bladder intact. According to my observations and experience, I give the preference to a deep, funnel-shaped incision of the edges of the fistula, similar to the incision in plastic operations in any other part of the body. The incision must be carried to the healthy tissue and all the cicatricial tissue extirpated.

"It extends quite through the walls of the septum to the vesical mucous membrane, and sometimes through it.

"In this way is formed a steep, funnel-shaped wound, with its point in the bladder and its base in the vagina, and its edges from 6 to 8 mm. thick.

FIG. 130.



Incising the Edges of the Fistula, Mediate Access (Simon).

"Although other authors wish to avoid as much as possible the enlarging of this defect, it is exactly here only, where union can take place by first intention, that I strive to have the edges as free from cicatricial substance and as prone to union as possible; and even in the largest fistula I do not refrain from this repeated paring of the edges, even to making the defect very much larger, until the union is accomplished. And even if with the best preparation of the edges the union does not take place, and we meet with entire want of success, the woman loses no more urine than before.

"Sometimes I cut the vesical mucous membrane, and sometimes avoid it, but place little weight on that.

"The advantages claimed are—

"1st. By the deep funnel-shaped incision all cicatricial substance will be certainly cleared away.

"2d. The edges are more prone to union, as they unite in a natural manner, edge to edge, and not with a flat surface on the same; the nerves, vessels, etc. thus continue on in the normal direction.

"3d. The very wide edge is unnecessary, as only the upper edges unite in any case.

"4th. If union does not take place the first time, a second attempt is more likely to succeed with the thick edges than where, with already thin edges, these must be bevelled off still more and made thinner.

"5th. The idea that catarrh is more likely to follow this form of incision is unfounded."

Uniting the Edges of the Wound.

Method of Uniting.—"There have been a great number of methods of bringing the edges together; all of which accomplish their purpose, but are more complicated than the method I published in 1854, which, with some modification, I have used ever since.

"In order to meet the indication for uniting, I use either one or two rows of fine silk sutures tied in the ordinary manner.

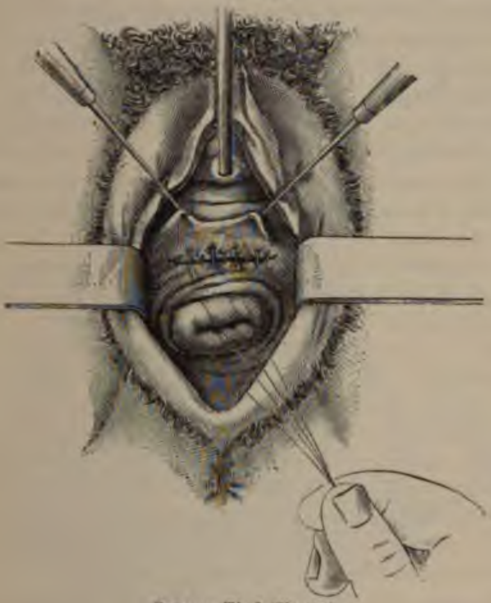
"In large fistulæ, where a great degree of relaxation is necessary in order to bring the edges into exact union, I use my so-called double suture, consisting of two rows, one the 'relaxing,' the other the 'uniting.' In small or in slit-shaped fistulæ I use only one, the uniting row. In the double suture one row, placed very deep and wide, approaches the tissues surrounding the fistula to the line of union, thus relaxing the edges; while the other, placed between the stitches of the first, holds firmly the edges, and thus promotes the most exact union. When only one is used, it is the uniting row, and placed in the same manner as here described. Of course each row of sutures supplements the other in its action.

"Both rows are placed very deep, even, in many cases, through the vesical mucous membrane. They thus bring the edges of the wound in their whole thickness in the closest union, and withstand greater traction than if they only seized a part of the edges. The sutures are 1–1½ lines apart. The point of entrance of the threads is, in the relaxing suture, some distance from the edge—in the uniting, quite near. I consider it of very little importance whether the suture goes through the vesical mucous membrane or not. It is only necessary to be careful that this membrane does not get between the edges of the wound.

After-Treatment.—"1st. From a series of observations I conclude hat neither on the wound nor on the new cicatrix does the urine have ny injurious influence, and neither hinders the union by primary intenion nor loosens a once-formed cicatrix.

"2d. From another series of observations I have learned that the healing is not interfered with by a degree of distension which could come in a normal filling of the bladder, provided only that the wound is perfectly freshened and united.

FIG. 131.



Sutures Tied (Simon).

"In most cases the permanent retention of the catheter only does harm.

"Each of these deductions is drawn from a number of appropriate cases.

"Upon these conclusions, then, is based my after-treatment, which up to the removal of the stitches is entirely unimportant. Those minute irections, the carrying out of which is so tedious both for the patient nd physician, are all laid aside. The patient is permitted to take any sition she chooses. She passes her water as soon as she feels the ed, either in a bed-pan or, if she object to that, in the sitting or kneeow position. Only in a few cases, where the patient is not in a conion to pass water spontaneously, is the catheter used every three or r hours. On the fourth or fifth day an attempt is made to remove e stitches, and this is repeated on the following days. On the eighth y the patient is allowed to leave her bed, even if all the stitches are t out.

"To avoid passages from the bowels, with straining, on the first eight days, a fluid discharge is recommended. If irritation of the bladder ensue, morphine, one-eighth grain per dose, should be given, and daily warm injections into the vagina, but not into the bladder, should be employed."[1]

Prof. Simon[2] reports the following results: "Of 118 fistulæ occurring in 105 patients, there were 104 fistulæ in 92 patients cured completely (a later cure is counted in under the first category); 5 fistulæ in 5 patients almost entirely closed; 2 patients with 3 fistulæ discharged as incurable; 6 patients died."

In the description of Simon's method here given the words of the author have been employed as much as possible, and now, in concluding our account of it, we proceed to express our opinion as to its value as compared with that of Sims. In a very few rare cases of extensive destruction of the base of the bladder in women who are exceedingly obese it answers a better purpose than that of Sims; but as a rule it is difficult to appreciate how any one who has tried both can consider the former as comparable to the latter. Indeed, it may justly be said that Sims's method leaves so little to be desired that all others are completely overshadowed by it.

Elytroplasty.—This operation was published to the profession by Jobert de Lamballe[3] in 1834, and was subsequently altered and improved by Velpeau, Gerdy, and Leroy d'Etiolles. It consists in dissecting a flap from one buttock (Jobert), or the posterior wall of the vagina (Velpeau and Leroy), and fixing it by sutures into the orifice of the fistula, the borders of which have been previously pared. It resembles the operations of rhinoplasty performed upon the face, but is unfortunately even more difficult than they, and calls for such great manual dexterity as to preclude its frequent adoption.

Elytroplasty may still be employed sometimes where great destruction of tissue has taken place at the base of the bladder, but the difficulties and uncertainties attending it, together with the fact that more simple and efficient methods for dealing with this class of cases are at command, have rendered a resort to it very rare.

To one unaccustomed to the treatment of fistulæ it would appear that the larger the fistula the more difficult would be its cure. This is not so: some of the most difficult cases will be found to be those in which the opening is so small as to be discerned with difficulty. In these cases we would strongly recommend the following plan: Introduce into the bladder a large steel sound, and by its extremity make the fistula to project toward the vagina; then cut away the tissue surrounding the fistula, so as to let the sound pass freely into the vagina. Sutures may then be passed and the enlarged fistula cured.

Closure of the Vagina (Kolpokleisis).

This procedure is resorted to in despair of accomplishing the cure of the fistula, and in the hope of relieving the patient from the intolerable annoyance attendant upon an involuntary and constant discharge of urine. It does not, of course, equal in efficiency closure of the vesical fistula, since it involves the necessity of the urine being retained in the vaginal canal, which is injured by its presence, and is proposed only for those cases in which, from extensive destruction of tissue, no hope of closure by suture or elytroplasty can be entertained. By it the vagina and bladder are rendered a common receptacle for urine and menstrual blood, the only advantage gained consisting in the fact that they may be retained and discharged at will through the urethra, which remains open.

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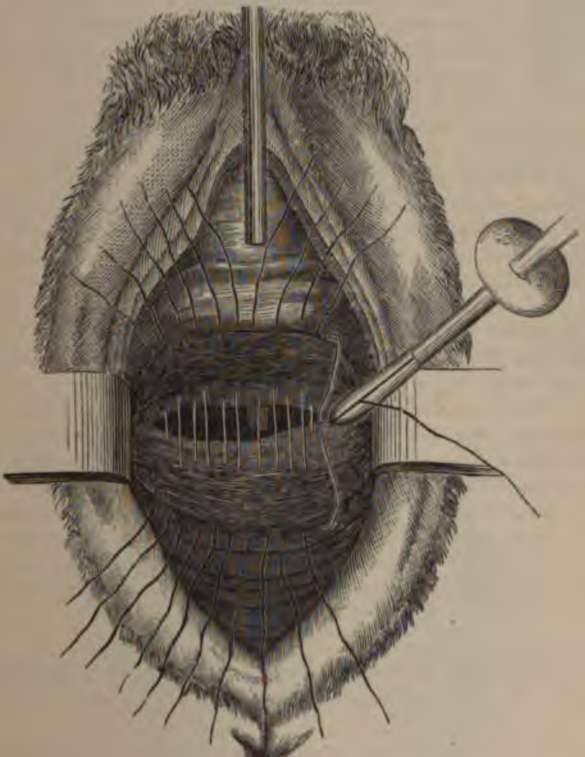
[1] This résumé has been prepared from Prof. Simon's work by Dr. M. D. Mann.

[2] *Am. Journ. Obstet.*, vol. ii. p. 241.

[3] *Bull. de l'Acad. de Méd. de Paris*, t. ii. p 145.

Closure of the vagina may be accomplished by two operations—episiorrhaphy and obliteration of the canal. The first, which consists in paring the inner surfaces of the labia majora and uniting them by sutures so as to cause their complete adhesion, originated with Vidal de Cassis, who performed it in 1833. The operation is exceedingly simple in its steps, but a very minute opening almost invariably remains just under the meatus, through which a little urine exudes. This very nearly invalidates the success of the method, for even a slight escape renders the patient uncomfortable.

FIG. 132.



Obliteration of the Vagina (Simon).

The second consists in paring, not the labia, but the vaginal walls. Strips of mucous membrane being thus taken away, the bleeding surfaces are brought in contact by suture, and the bladder is kept empty by a catheter until union has occurred. This procedure, a far more valuable and reliable one than that of Vidal, was first performed by Simon, who has applied to it the name of "kolpokleisis," or cross obliteration. Prof. Simon's first operation was performed in 1855, and since that time he declares that it has been resorted to in Germany in over fifty cases with complete success, and many cases suffering from incontinence of urine due to great loss at the base of the bladder have been entirely relieved by it. He places a very high estimate upon the operation, as the following extract from a published letter from him to Dr. Bozeman of this city will show:

> "The reason why I have proved the validity of my claims of priority at such lengths is simply this, that in my opinion kolpokleisis is the most important plastic operation which in the last decennia has originated from one single man. The operation of vesico-vaginal fistula by uniting the borders of the defect is indeed, in its present perfection and precision, a much more important acquisition than kolpokleisis, and probably the greatest achievement of our century in plastic surgery; but it has not been carried to that perfection by a single man, but, on the contrary, operators of all nations have contributed their share to it. The 'uranoplastie' of our ingenious countryman, Von Langenbeck, could alone be placed by the side of kolpokleisis, as far as the safety of the performance and its immediate success are concerned. It would rank higher still on account of its more frequent occurrence if its benefit for the voice in increasing its purity could be secured in all or the majority of cases. But as in many cases this result is not obtained at all, and in others only incompletely, kolpokleisis must be considered the more important operation, as in all cases it fully answers its purpose. This operation, which I invented at the time when the obliteration of the vulva, proposed by Vidal, proved inefficacious in re-establishing continence of urine, has already been performed more than fifty times with complete success. Through it many patients with incurable defects of the bladder have been freed of the most intolerable suffering—viz. incontinence of urine. I have myself succeeded in eighteen cases in effecting perfect obliteration, and every German surgeon who practises the art of curing vesico-vaginal fistulas has recorded one or more successful cases of that kind."

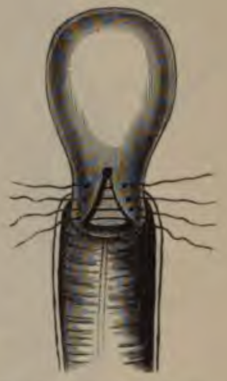
In his earlier operations Prof. Simon confined this procedure to the lower section of the vagina, but he now obliterates the canal just below the loss of substance.

A recent German operator has recommended and successfully practised an operation by which the accumulation of menstrual blood and urine is transferred from the bladder to the more tolerant rectum. He first makes a recto-vaginal fistula, and when this is healed closes the vaginal cleft from posterior commissure to clitoris. In time the rectum becomes able to retain the urine as long as three hours, or a much longer time than the usually contracted bladder in such cases will ever attain.

Urinary Fistulæ requiring Special Treatment.

In the great majority of instances no other plan of treatment than the suture is necessary. There are, however, cases of urinary fistulæ in which the application of the suture is difficult or even impossible. These will now engage our attention.

FIG. 133.



The Cervix is slit to Expose the Fistulæ above, and Sutures are passed.

Vesico-cervical Fistulæ.

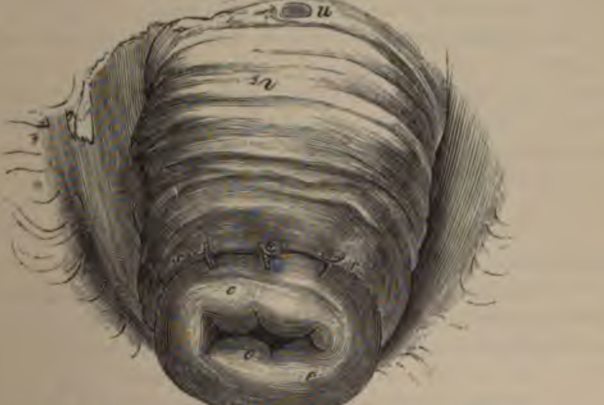
Jobert first pointed out the proper method for reaching these. His plan is not at present employed, but that now regarded as most reliable is only a modification of it. It consists in slitting up the anterior lip of the uterus until the fistula is reached, vivifying its edges, and passing sutures directly through the cervix, as represented in Fig. 133, so as to approximate the walls of the cervix and the lips of the fistula.

In case the fistulous orifice be so high as to be considered beyond reach, the only remaining resource is to close the os uteri externum by suture and allow menstruation to occur through the bladder.

Vesico-utero-vaginal Fistulæ.

For these the plan of vivifying the anterior lip of the os, and thus making the uterine tissue subservient to closure of the fistula, is peculiarly applicable. The operation, represented at Fig. 134, is similar to that for ordinary vesico-vaginal fistula, the only difference being that one lip of the fistula is made of the vivified cervix uteri.

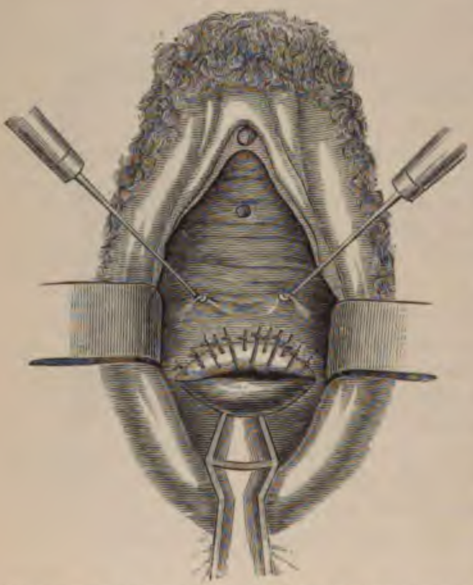
FIG. 134.



Anterior Lip of Fistula united to Anterior Lip of Cervix (Simon).

In case the anterior lip of the uterine neck be so completely destroyed that it cannot furnish the requisite tissue for this purpose, the vagina may be united to the posterior lip so as to throw the cervix into the bladder. Menstruation will afterward occur into that viscus, and the blood thus accumulating be discharged with the urine.

FIG. 135.



Vesico-utero-vaginal Fistula, Sutures in place (Simon).

Fistulæ with Extensive Destruction of the Base of the Bladder.

It has already been mentioned that elytroplasty and kolpokleisis offer resources in these cases. To Dr. Bozeman, however, we are indebted for still another procedure, the first step of which consists in dragging the uterus down daily for weeks before the operation by means of a pair of forceps, by which the neck is seized. In this way the uterus is made to approximate the vulva. Then one lip of the cervix, being vivified, is brought into contact with the extremity of the remains of the vesico-vaginal septum and firmly united with it by suture.

To facilitate this procedure the cervix may with great advantage be slit to the vaginal junction, drawn forward, and made to fill the space left vacant by the sloughing of the vagina.

We would call attention to one danger from this procedure—namely, the rupture of unknown adhesions between the uterus and adjacent organs, which may cause severe or fatal peritonitis. We have known such an accident to occur.

Uretero-uterine and Uretero-vaginal Fistulæ.

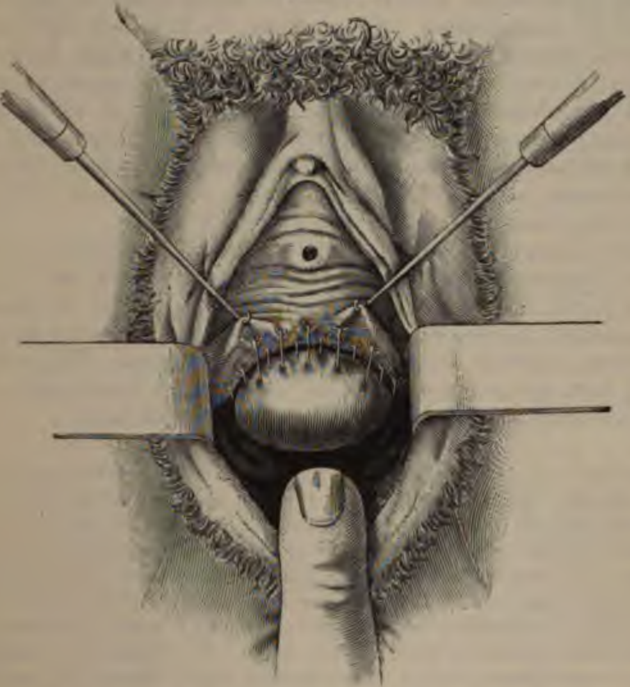
In addition to the varieties of urinary fistulæ mentioned here, certain rare instances of union between the ureters and vagina or uterus have been recorded. A striking example of uretero-uterine fistula may be found detailed in the *Dictionnaire de Médecine*, vol. xxx., by M. Bérard. It is not only interesting in itself, but, as displaying the method by which the diagnosis may be arrived at, is worthy of special mention. Regarding it at first as a vesico-uterine fistula, from the fact that urine was discharged from the uterus, he arrived at a different diagnosis from these facts:

1st. The urine flowed steadily from the cervix when the bladder was empty.

2d. The urine thus flowing was limpid, unlike that from the bladder.

3d. The patient being kept seated over a vessel for two hours, so as preserve all the urine flowing *per vaginam*, a catheter was passed into the bladder and the amount removed exactly equalled that which had escaped vicariously.

FIG. 136.



Posterior Lip united to Anterior Edge of Fistula (Simon).

4th. Injecting the bladder with fluid colored by indigo, the urine passing *per vaginam* remained limpid.

5th. A sound being passed into the uterus and another into the bladder, their points could not be brought into contact.

Uretero-uterine fistula is by no means common; only one instance is mentioned by Dr. Emmet in his well-known work as having occurred in his extensive experience. Dr. W. H. Baker[1] of Boston has recently published an interesting case, which was cured by dissecting up the ureter, which ended at a point near the meatus urinarius, making an opening near the neck of the bladder, turning the ureter into this, and then closing the vaginal wound.

Dr. Henry F. Campbell[2] of Georgia reports an interesting case of uretero-vaginal fistula which he cured by this simple procedure: Passing a small bistoury up the ureter, he slit its anterior wall, the knife passing into the bladder. He then closed the vaginal surface of the cut thus made with silver suture. The patient rapidly and entirely recovered.

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[1] *N. Y. Med. Journal*, Dec., 1878.

[2] *Amer. Journ., Med. Sciences*, Jan., 1880.

An exceedingly interesting instance of this variety of fistula is mentioned by Zweifel of Erlangen, in which he removed the kidney of the diseased side with a successful result. The right kidney, which was left, proved quite sufficient for the wants of the economy.

There are eccentric and rare forms of fistula which we have not mentioned in my enumeration. For example, we have met with three cases of vesico-abdominal fistula. In one of the cases eight days after the operation of ovariotomy about one pint of urine began to pass daily through the abdominal opening, the lower angle of which had been kept open for washing out the peritoneum. That the fistula was vesical, and not ureteral, was proved by the escape of colored fluid through the abdominal wound when injected into the bladder. This patient entirely recovered and the fistula healed of itself.

Where a larger extent of denuded surface is required than can be obtained by paring the edges of fistulæ, Langenbeck and Colles have resorted to the following plan: Splitting the edges of the fistula, they have separated the two flaps thus produced, and, bringing the opposing raw surfaces together, have secured them by suture. This method has recently been revived by Tait, who operates by touch only. But he has so far found no imitators on this side of the Atlantic.

Treatment of Long, Tortuous, Capillary Sinuses remaining after Operation by Suture.—[Sometimes fistulæ situated near and involving the neck of the uterus will be cured in great part by suture, and yet at one or both extremities of the original opening long capillary sinuses will remain, which, running a tortuous course, reach the bladder and render the operation a failure. Under these circumstances it is almost impossible to pare the edges of these tracts by knife or scissors, and the cautery, which has been generally used for them, commonly fails to cure them. For these I have adopted with the most satisfactory results the following plan: Having a dentist's burr made with cutting flanges, instead of dull ones, such as are usually employed, it is fitted to the ordinary dentist's treadle; as the burr is made to revolve rapidly by the action of an assistant's foot, it is passed several times up and down the sinus to be closed, until the operator feels that the entire canal is thoroughly denuded. Then by curved needles deep sutures are passed, approximating its vivified walls. By this means I have cured several fistulæ situated just in contact with the cervix uteri, which would been exceedingly difficult of cure by any other method. It has the advantage of being very expeditious, and I would urge its claims in this class of cases.—T. G. T.]

CHAPTER XVIII.

FECAL FISTULÆ.

Definition.—These, which are much less frequently met with than urinary fistulæ, consist in communications established between the vagina or vulva and some part of the intestinal tract.

Varieties.—They may be recto-vaginal, entero-vaginal, or recto-labial; the first being the most common, and the second the rarest of the varieties.

Causes.—The causes which produce them are almost identical with those which result in urinary fistulæ—viz.:

Prolonged pressure;
Direct injury;
Ulceration or abscess.

The first of these may produce them, as it does those occurring on the anterior vaginal wall, by creating an intense inflammation which results in sloughing, or the intensity of the pressure may be so great as rapidly to destroy the vitality of the part. Such pressure is most frequently the result of difficult parturition, but in rare cases it may arise from badly-fitting pessaries or scybalous masses in the rectum.

Direct injury by instruments used in delivery or others employed for removal of impacted feces may evidently produce them.

Ulceration or abscess much more frequently produces fecal than urinary fistula. For the recto-vaginal variety stricture of the rectum is a fruitful source, the stricture producing a retention of fecal matters which excites ulceration that may extend to the vaginal canal. An abscess between the vagina and rectum may cause a communication between the two, or, burrowing toward one labium, may open there and connect this part by a tract with the rectum. In the same manner a purulent collection has been known to make a junction between the caput coli and vagina. Lastly, syphilitic and cancerous ulceration may open a channel between the intestinal and vaginal canals.

Symptoms.—The most prominent, often the only, symptom which will attract the patient's attention will be a discharge of offensive gas or fecal matter by the vagina. The amount which escapes will of course be governed by the size of the fistula, but the annoyance dependent upon the accident will not be so, for even the smallest quantity will be sufficient to render the patient utterly wretched by the offensive odor to which it gives rise.

Physical Signs.—The patient being placed upon the back, touch should be practised upon all the surface of the vagina. If the fistula be one of any magnitude, this will at once discover it. If not, careful exploration by the speculum will almost always do so. Sims's speculum should be introduced under the symphysis, so as to lift the anterior wall of the vagina while the lateral walls are held aside by spatulæ. Should visual exploration not reveal the opening, the rectum may be filled with tepid water colored with cochineal or indigo, and its escape carefully watched for, or the recto-vaginal septum may be lifted up with the index finger in the rectum, and the fistula be thus exposed.

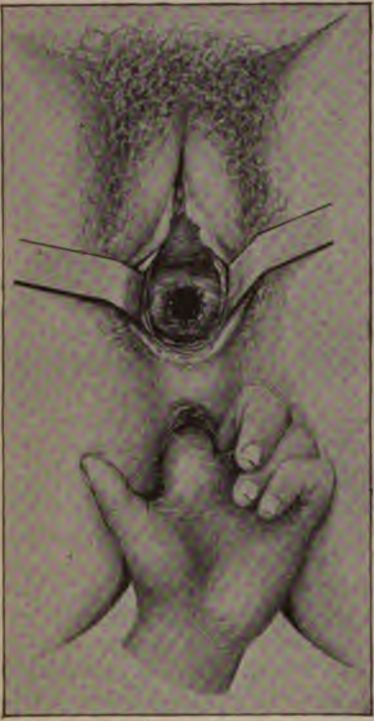
Prognosis.—Fecal fistulæ are more likely to be spontaneously recovered from than those of urinary character, from the fact that they give passage to occasional gaseous and semifluid excretions, and not to a fluid which is constantly dribbling away and keeping the fistulous walls from uniting. But even these are rarely recovered from unless surgical aid be brought to their relief.

Treatment.—Recto-vaginal and recto-labial fistulæ should always be treated by denudation and suture.

This is practised upon the same plan as that which is followed in vesico-vaginal fistulæ, with these exceptions, that the patient is placed in the position adopted in operating for stone, and that the speculum is so inserted as to elevate the anterior instead of the posterior vaginal wall. Before operation the sphincter ani muscle should always be paralyzed by thorough stretching by the fingers, and after it a rectal tube should be retained, unless very annoying to the patient. After the operation, too, the rectum, which should have been thoroughly emptied by enema before it, should be kept perfectly quiet by opiates for ten or twelve days. When evacuations are first permitted laxatives should be employed in order to avoid tenesmus, which might destroy the union of the lips of the fistula.

In one case of recto-vaginal fistula we have introduced the speculum into the rectum and closed the fistula on the rectal surface. The facility with which the operation was performed was surprising. Should the fistula exist only a short distance above the sphincter ani, the best form of treatment is to cut completely through the perineal body, vivify carefully, and close the wound, precisely as in the operation for complete laceration of the perineum.

Fig. 137.



Examination for Fecal Fistula.

Entero-vaginal Fistulæ.

Entero-vaginal Fistula, which consists in a fistulous tract between some part of the intestinal canal above the rectum and the vagina, is rare, and when existing should be looked upon as an artificial anus, the closure of which would be attended by danger. If the opening be direct and there be no tract leading from one canal to the other, this would not be the case, but if a tract exist the closure of its vaginal extremity would probably result in abscess excited by fecal matters passing out of the intestine.

Simple Vaginal Fistulæ.

Definition.—Under this head are grouped those forms of fistulous connection with the vagina which do not act as vicarious outlets for any neighboring organ, as, for example, peritoneo-vaginal, perineo-vaginal, blind fistulæ.

Peritoneo-vaginal Fistula has been rarely met with. When it does occur it is attended by danger of descent of the intestine into the vagina and entrance of fluids and air into the peritoneal cavity. One reason for its rarity is probably the fact that, no excrementitious substance passing through it, it very generally disappears without becoming chronic. Should it not do so, no annoyance would arise from its existence, and it would be susceptible of immediate cure by suture.

Perineo-vaginal Fistula may result from partial closure of a ruptured perineum, leaving a small orifice near the sphincter ani; from penetration of the presenting part of the fœtus through the perineum; or from paravaginal or pararectal abscesses which have burrowed toward the skin and opened on the perineum. It may be readily cured by incision, ligature, cauterization, or injection, after the plan just pointed out in connection with fecal fistulæ. Thorough incision, with use of the sharp curette and packing with iodoform gauze, forms the most reliable treatment.

Blind Vaginal Fistulæ are those which lead to a purulent collection in some part of the pelvis. They will be fully treated of when considering pelvic abscesses, and nothing need be said of them here further than to mention the principles upon which their treatment rests: 1st, dilatation of the fistulous tract by tents or incision; 2d, exerting an alterative action on the walls of the abscess by the sharp curette and by iodine, iron, nitrate of silver, etc.

CHAPTER XIX.

ACUTE ENDOMETRITIS.

WE freely confess that the arrangement of no subject treated of in this work has caused us more perplexity, and is offered to the reader with greater hesitancy, than that which relates to the division of endometritis. Having personally no theory to sustain in reference to the matter, our sole desire is to present the subject in the manner which will best aid in its comprehension, assist the practitioner at the bedside, and favor a future advance in its pathology.

Throughout the literature of gynecology admissions will everywhere be found of the fact that endometric inflammation limits itself to the neck, the body, or even, according to one authority,[1] to the fundus of the uterus, and yet the two varieties of the affection are treated of as one, and one author[2] even goes so far as to assert that "the facility for locating its limit exclusively to cervix, body, or fundus rests only in the brain of the theorist." Barnes treats of the whole subject as "endometritis," yet with characteristic candor he says, "It appears to me that attention has been too strictly fixed upon the visible changes in the cervix and os uteri, and that, thus engrossed, the mind has been closed against the less telling evidence of changes in the body of the uterus."

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[1] Dr. Routh's article on "Fundamental Endometritis."

[2] Dr. T. A. Emmet, *op. cit.*

All things being carefully considered, we have thought it best to adhere to the arrangement which follows, guarding the reader against the idea that any facility of differentiation, any dogmatic certainty of conclusion, is claimed in reference to the matter. The arrangement simply seems to us, for many reasons, that which best meets the requirements of the present and favors the prospects of the pathology of the future.

The varieties of inflammation of the lining membrane of the uterus may be clearly expressed in the following manner:

Endometritis.
- Acute,
  - General,
  - Cervical,
  - Corporeal.
- Chronic,
  - General,
  - Cervical,
  - Corporeal.

While we think that a catarrhal inflammation of the neck of the uterus may very well exist without involvement of the body of the organ, we feel convinced that the cervix can scarcely escape if the upper portion of the uterus is diseased.

Synonyms.—Acute endometritis has been treated of under the names of acute uterine leucorrhœa, acute uterine catarrh, acute internal metritis.

Frequency.—Acute inflammation of the lining membrane of the uterus is a condition which occurs quite frequently. Often running a rapid course, however, and ending in recovery or in chronic disease, it passes unrecognized in many cases. In this way we would explain many of the cases of suppressio mensium and congestive dysmenorrhœa which we so often find ending in chronic disease. And thus also would we account for the profuse and painful attacks of leucorrhœa occurring with exanthematous fevers, and lasting for a length of time after they have passed off. It is very generally stated that acute metritis is seldom met with except as a sequel of parturition, and we agree in the statement as applying to parenchymatous inflammation; but it does not apply to endometritis, which often proves the source of sudden menstrual disorder and the cause of violent leucorrhœa.

Varieties.—The morbid process may affect the lining membrane of the cervix or of the body alone, or it may attack the whole uterine mucous tract, its selection of site being governed by its cause. Thus, that form which immediately follows parturition or abortion (the so-called "endometritis of subinvolution") or results from gonorrhœa is likely either to affect the whole mucous tract or the cervical canal alone: while that which is due to sudden checking of the menstrual flow is more likely to be confined to the body.

While, theoretically, a sharp limitation of the catarrhal condition may readily be made between the cavities of the body and the cervix uteri, so close a line cannot usually be drawn in practice. A catarrhal inflammation of the body of the uterus will usually spread to, and by direct contact infect, the mucous lining of the cervical cavity. But the converse does not hold good in nearly the same proportion. A cervical endometritis dependent on laceration of the cervix, for instance, very commonly is limited to that part only, the mucous membrane of the body of the uterus remaining perfectly healthy.

Causes.—The causes of acute endometritis are the following:

Direct injury;
Cold from exposure during menstruation;
Constitutional disease of septic or asthenic character;
General anæmia;
Vaginitis, specific or simple;
Excessive venery;
Suppression of menstruation.

Examples of direct injuries which may produce acute endometritis are the introduction of the uterine sound or the intra-uterine pessary, the employment of tents or the application of chemical irritants, surgical operations, and intemperate coitus.

It is probably in some instances through the instrumentality of this disease that those cases of fatal peritonitis which result from tents, sounds, and intra-uterine pessaries occur. Inflammatory action is first set up in the lining membrane of the uterus, and thence swiftly passes through the Fallopian tubes to the peritoneum.

Specific vaginitis or gonorrhœa will sometimes pass up into the cervix and body of the uterus and out through the Fallopian tubes, creating pelvic peritonitis of most violent character. Even simple vaginitis, when of very severe form, may produce endometritis, though this is by no means common.

The peculiar blood-state attending upon and forming an element of measles, scarlatina, variola, and roseola, and exerting its influence on all the mucous linings of the body, will sometimes result in general endometritis and general anæmia, and the hemic condition resulting from phthisis very frequently does so.

Exposure to cold and moisture, great mental anxiety, or any other influence which suddenly checks the menstrual flow not infrequently produces this disease. At the moment of exposure suppressio mensium or congestive dysmenorrhœa may take place, and from that time endometritis may exist. When we consider that such a sudden check of menstruation will sometimes result in hematocele of fatal character, it is certainly not to be wondered at that it may likewise produce the disease of which we are speaking.

Excessive venery, even where no violence is done to the uterus, may produce it by the prolongation of intense congestion of the organ kept up by this act.

Frequency.—Although we do not deny that the acute stage of this disease may occur frequently, we still have had but few opportunities of seeing it uncomplicated with pelvic peritonitis or cellulitis. Generally, when the cases of endometritis came to our notice they had become subacute or chronic, or the disease of the endometrium was secondary to inflammation of the uterine adnexa or the pelvic peritoneum.

Symptoms.—The disease demonstrates its presence in the non-puerperal uterus without any very violent symptoms.

Ordinarily, the patient complains of pain, weight, and dragging in the pelvis; pain in the back, groins, and thighs; burning and pricking in the vagina; and vesical and rectal tenesmus. After four or five days there is usually a discharge of a viscid liquid, which in eight or ten days becomes creamy, purulent, and perhaps bloody; tympanites and sensitiveness upon pressure and uterine tenesmus or "bearing-down pains" show themselves in severe cases, and at times, though rarely, there is active diarrhœa, due to reflex irritation of the rectal nerves. Should the fluid discharged from the vagina be allowed to come in contact with the skin of the vulva, abdomen, or thighs, an intense cutaneous irritation is established, which may go on to excoriation and the development of pruritus of aggravated character. In two cases we have seen prurigo thus excited which spread over the entire body. If the reaction of this purulent discharge be examined into, it will sometimes be found to be acid and at other times alkaline. The explanation of the fact is this: the discharge from the uterus is alkaline, and that from the vagina acid. If the irritating uterine fluid have established, as it very generally does, vaginitis, the acid secretion from this source overcomes the alkalinity of that from the other. If, on the other hand, no severe vaginitis exist, the discharge from the uterus presents its ordinary alkaline features.

Physical Signs.—Upon examination by touch the os uteri is found gaping, the cervix swollen and very sensitive to pressure, the body slightly enlarged, and the whole organ lower than normal in the pelvis. Through the speculum the cervix is found to look swollen, œdematous, and red, and from the pouting os pours forth either a clear, albuminous-looking fluid muco-pus or long tenacious shreds of cervical mucus. All explorations of the uterus should, as a rule, be avoided. The probe, if used at all, should be employed with the greatest caution, and never unless passed through the speculum. The sound as ordinarily used should not be thought of. Probing will discover great sensitiveness throughout the uterine cavity, and the slightest touch upon the fundus will cause the discharge of a few drops of blood. Indeed, so great is the engorgement that even the introduction of the speculum will often cause blood to flow from the cervix.

Bimanual examination will discover the uterine body enlarged and tender upon pressure, so that one who judged hastily and without sufficient knowledge of the subject would be very apt to diagnosticate with great positiveness acute parenchymatous metritis. There can be no doubt that many of the reported cases of that affection have been nothing more than instances of this form of endometritis.

Differentiation.—The only diseases with which this would with any probability be confounded are para-uterine cellulitis, pelvic peritonitis, and acute vaginitis. In the first two of these constitutional disturbance is generally more marked and excessive than in this; they are often preceded by chill, and usually by more intense febrile action and greater elevation of temperature. This, however, is not universally true. The last is very generally attended by a lesser degree of general disturbance. No positive conclusion can usually be arrived at without physical exploration, which in pelvic inflammation will discover fixation of the uterus, hardening of peri-uterine tissue, and excessive tenderness when parts other than the uterus are compressed by conjoined manipulation. It will be generally noticed that in cellulitis and peritonitis there is but a moderate increase of uterine or vaginal discharge.

Pathology.—In its first stage acute endometritis consists in an intense and active hyperæmia of the mucous lining of the uterus, which is red, swollen, œdematous, and softened. Its surface is spotted, Scanzoni declares, from congestion of the capillary network around the mouths of the utricular follicles. When the second stage has set in, the cavity of the uterus is found to contain an excess of mucus or creamy-looking pus, which may be more or less mingled with blood. If the cervix be involved in this inflammatory engorgement, the mucous membrane of its vaginal portion participates markedly, as an examination by the speculum will prove.

In the mucus just mentioned the microscope reveals the presence of thousands of cells, and sometimes entire casts of the utricular follicles.

"Ordinarily," says Scanzoni,[1] "acute catarrh of the mucous membrane of the uterus is accompanied by a congestive swelling of the muscular substance of the womb, and most generally it is possible, particularly in the most internal layers of the organ, to see with the naked eye that the vessels are gorged with blood. There ordinarily result from it an infiltration and a softening, which are much greater in the layers of the parenchyma of the uterus nearest to the mucous membrane. Hence those alterations of tissue which are characteristic of acute parenchymatous metritis ordinarily accompany catarrh of the mucous membrane when this has attained a high degree of intensity." "The whole substance of the uterus," says Klob,[2] "generally appears to be increased, and its tissue more vascular and succulent, especially in the layers nearest the mucous membrane."

Acute endometritis very rarely shows itself before puberty.

Complications.—Its complications are acute metritis, urethritis, vaginitis, vulvitis, cystitis, salpingitis, pelvic peritonitis, and various eruptive disorders the results of scratching excited by pruritus vulvæ.

The first of these complicating conditions is of so much moment as to require special consideration.

The time has, we think, arrived when with our present light upon the subject acute parenchymatous metritis should be given a subordinate place in pathology, instead of the prominent one which it formerly occupied. With reference to its frequency as a primary affection many conflicting statements will be found. This arises partly from the fact that some have written of it without making any distinction between the forms occurring in the puerperal and non-puerperal states, while others have confined their remarks, as it is here done, to the disease in the latter condition, partly from endometritis, active congestion from suppressio mensium, and peritonitis and cellulitis having been mistaken for metritis, and in great part from the difficulty of gaining post-mortem evidence, the disease being rarely fatal. As a complication of inflammation of the internal mucous or external serous covering of the uterus, parenchymatous inflammation is universally admitted. As a pathological entity, however, we question whether any well-authenticated case of this affection is on record. The descriptions of the disease which are given in recent works—such, for example, as those of Courty, Gallard, and Scanzoni, each of whom devotes considerable space to it—appear to us to have come down to us as a matter of literary tradition rather than of clinical research.

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[1] *Diseases of Females,* American ed., p. 193.

[2] *Path. Anat. Female Sex. Organs,* American ed., 231.

While searching for a case of pure uncomplicated metritis we have seen numbers of cases which were regarded by others as of this character, and quite a number which we viewed as such until enlightened by post-mortem or other evidence. Rokitansky[1] declares that "in acute inflammation of this organ generally the lining membrane of the uterus is affected primarily, and that this is scarcely ever the case with the uterine tissue, as far as can be demonstrated by the pathological anatomist, with the exception of the reaction following traumatic influences, especially of the vaginal portion."

Klob[2] takes still stronger ground as to the existence of uncomplicated metritis, and asserts that, never having met with an instance of the disease, he is forced to describe it upon the authority of others.

Some practitioners are prone to regard every case of inflammatory action in the pelvis, accompanied by great tenderness over the uterus, as "metritis." Such cases are much more frequently due to pelvic cellulitis or peritonitis, which are by no means rare affections, or to active congestion caused by suppression of the menses or excessive coition. After parturition, either at term or premature, true metritis does occur not unfrequently, but this variety does not concern our present investigation. As regards that form which we are considering, we feel convinced that, if the experienced practitioner will put aside his preconceived views and interrogate the results of his observation, he will find, if he has his attention aroused to the frequency of the diseases which simulate it, that he has met with this affection very rarely.

Course, Duration, and Termination.—Acute endometritis, when occurring in the non-puerperal state, may, without treatment even, go on to recovery, generally lasting from a month to six weeks, and perhaps passing through its whole course without its existence having been diagnosticated. It sometimes ends in the chronic form of mucous inflammation, or even in slight hyperplasia, the superficial subjacent connective tissue becoming affected. It is doubtful whether any severe case of endometritis runs its course without being to a greater or less extent complicated by a slight degree of parenchymatous disorder. As already stated, the disease may end in chronic endometritis or in recovery. It may likewise end in death, inflammatory action spreading along the Fallopian tubes and causing salpingitis, which, by resulting in free purulent discharge into the peritoneum, may establish inflammation there.

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[1] *Patholog. Anat.*

[2] *Path. Anat. Female Sex. Organs*, American ed., p. 231.

Prognosis.—In spite of all these possibilities the prognosis is always favorable if the patient takes ordinary care of herself and yields to a judicious plan of treatment. But it should always be borne in mind that the apparent acute endometritis may be but the precursor or companion of an attack of acute pelvic peritonitis, and that the treatment should be directed toward the latter condition quite as much as toward the former.

Treatment.—The diagnosis having been clearly made, treatment should be at once established. Complete rest of mind and body should be regarded as essential points. In severe cases the patient should be kept perfectly quiet upon her back in bed, and not allowed to leave it or to assume the sitting posture even to satisfy the calls of nature. Opium should be given by mouth or rectum for the production of perfect nervous quiescence and for the relief of pain, the dose and the frequency of its repetition depending entirely on the severity of the pain. When the latter is relieved the opium should be discontinued. The bowels should be regulated by mild saline laxatives, and ordinarily no other medicine is required than antipyrine, phenacetine, or antifebrine, if the rise of temperature calls for them. Over the hypogastrium a soft, warm poultice of powdered linseed should be placed and covered by oiled silk. This need not be renewed oftener than once in twelve hours, for the oiled silk will preserve its warmth. Or if poultices cannot be procured, hot fomentations will do very well, the cloths being covered with oiled silk and changed as often as they begin to dry. The patient should not be annoyed by leeches or cups. The diet should be very simple, and should consist of fluid food chiefly, as milk, beef-tea, etc. As soon as free secretion of muco-pus begins to show itself the vagina should be gently syringed out three times daily with copious injections of very warm water, administered from a fountain syringe, with the patient lying on a douche-pan or on a rubber sheet at the edge of the bed. All examination by speculum, probe, and, after a diagnosis has been made, even by the finger, should be avoided unless some special indication demand it. Astringent injections and all vaginal applications are injurious. The affection which we are treating is located in the uterus, not in the vagina, and such applications merely annoy the patient and aggravate the disease. The warm injections which have been advised act as poultices or fomentations to the whole internal surface of the pelvis, at the same time that they ensure cleanliness to the vagina and remove from it a fluid which if left there might excite vaginitis. Under this plan of treatment the patient should be kept until recovery, or until we are admonished by time that the disease has passed into its chronic form and requires different remedies.

More active measures, such as the application of leeches to the cervix or the introduction of the solid stick of nitrate of silver into the uterine canal for the purpose of cutting short the inflammatory process, should on no account be adopted. They are relics of now-abandoned therapeutics, and would be more likely to light up an acute pelvic peritonitis than to reduce the catarrhal inflammation for which they are used.

CHAPTER XX.

CHRONIC CERVICAL ENDOMETRITIS.

When inflammation of acute character affects the uterus, it has a marked tendency to invade the entire organ and to involve both cervix and body, but with chronic inflammation this is not the case. Being of a lower grade of intensity, it more strictly confines itself to the mucous membrane and limits itself to the body or cervix. Such limitation is, however, neither universal nor absolute, sometimes subjacent parts being more or less implicated, and at others the mucous membrane of the entire organ being simultaneously and equally involved.

Definition.—By the term chronic cervical endometritis is meant chronic inflammation of the mucous membrane, extending from the os externum to the os internum.

Frequency.—Of all diseases of the genital system of the female, this is without doubt the most frequent, and, although not in itself a malady of dangerous character, may prove the starting-point for some of the most serious and rebellious of uterine disorders. Exposed as the cervix uteri is to injury during coition, laceration from parturition, and irritation from walking, riding, and lifting, it is not surprising that its complicated investment should frequently become the seat of disease.

This affection, too, is a frequent source of menstrual disorders, and very commonly produces sterility.

Synonyms.—It has been described under the names of cervical catarrh, cervical leucorrhœa, and endocervicitis.

Anatomy of the Cervical Mucous Membrane.—The cavity of the cervix uteri is a fusiform canal measuring about one inch and a quarter, beginning at the os externum below and ending at the os internum above. On the anterior and posterior walls of the cervix are ridges from which folds are given off which are arranged with regularity, and run obliquely upward and outward, to end in other indistinct lines on the sides of the canal. This arrangement of mucous membrane has received the name of arbor vitæ.

Between these folds numerous mucous glands are seen, their number in a well-developed virgin cervix being estimated at least at ten thousand. An occlusion of the ducts of these glands causes their distension with mucus, when they form small translucent cysts which either appear flat or project like peas from the surface of the cervix; in the latter condition they are known as "ovula Nabothi," after the anatomist Naboth, who first described them. The mucous membrane forming these folds or rugæ is covered by cylindrical and ciliated epithelium and studded by villi, which are found in considerable numbers upon the larger rugæ and other parts of the mucous membrane.

The natural secretion of the cervical canal has been shown by M. Donné to be alkaline, unlike that of the vagina, which is acid.

Pathology.—Cervical endometritis consists in inflammation of all this structure and consequent alteration of its condition. The mucous glands are especially involved in the morbid action, the disease chiefly consisting in glandular inflammation. The glairy mucus which is secreted in large amount as one of its symptoms is the characteristic discharge of these structures. Looked at with a strong glass in post-mortem examinations of this disease, they are seen enlarged and elevated, and their mouths may be seen very much dilated. In some cases it becomes complicated by granular degeneration. The villi or papillæ, especially those on the vaginal face of the cervix, become diseased. At first there is a loss of the normal supply of epithelium, which produces a slight and very superficial abrasion. This becomes in time more distinct and marked, from destruction of the villi themselves over spaces of greater or less extent. If this process of destruction should go on and affect the deeper tissues, a true ulcer would be formed, and no one would ever have denied the name of ulceration to the existing condition, but it does not thus progress. In time an hypertrophy occurs in the villi, which increase in size, project like so many hairs from the surface, and give to the os and cervix an appearance which has caused the term granular degeneration to be applied to it. This state affects the vaginal portion of the cervix chiefly, but may extend up the canal.

Another pathological state which is occasionally met with as a complication of cervical endometritis is an eversion of the os and lower portion of the canal to such an extent as to keep up inflammation there by the friction of the membrane thus exposed against the floor of the pelvis. Some very obstinate cases are due to this condition.

The diseased mucous membrane pours forth with great activity large amounts of thick, tenacious mucus, which is loaded with epithelium and sometimes tinged with blood.[1]

Predisposing Causes.—It is a matter of some moment that the etiology of this affection should be studied under two heads—predisposing and exciting. The former includes—

Impoverishment of the blood from chlorosis or some other form of malnutrition;
Frequent parturition;
Subinvolution;
Styles of dress which depress the uterus.

These influences either act injuriously upon the nervous system, and interfere with the circulation and nutrition of the lining membrane of the cervix, or by directly disordering the vessels and nerves of the uterus render it ready for the establishment of disease by some cause which would have exerted no baneful effect upon a woman in perfect health.

It may naturally be asked why some of these influences should especially produce this disease. Our answer is, that they do not do so. Sometimes they cause chronic pneumonia; at others times granular eyelids; at others follicular pharyngitis; and again at others chronic cervical endometritis.

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[1] For a further description of the pathology of these products of cervical catarrh see the chapter on "Granular and Cystic Degeneration of the Cervix Uteri." The discussion of the latter subject might properly have been included in this chapter.

Exciting Causes.—Chief among these may be enumerated—

Laceration of the cervix;
Displacements of the uterus, especially flexions;
Excessive or intemperate coition;
Puerperal endometritis;
Acute non-puerperal endometritis;
Efforts at production of abortion and prevention of conception;
The use of intra-uterine pessaries.

Many of the causes mentioned would fail to produce it in a uterus which had not been prepared for their action by depreciating constitutional conditions. When treatment is established for the cure of the disease, if it be inaugurated and pursued without regard to the predisposing causes, it will often prove inefficient or futile in cases which would yield to a plan that showed a recognition of their importance. Appreciating highly, as we do, the value of local treatment in uterine affections, were we in the management of the disease limited entirely to one kind—local or general—we do not hesitate to say that we would infinitely prefer the latter. A removal from a city to the country, the use of mineral and vegetable tonics, plenty of good, nutritious food, the observance of regular hours, systematic exercise in the fresh air, and the pleasures of cheerful society, will, we feel confident, do far more for the patient than a weekly visit to the office of a physician and the reception of the most appropriate local treatment which science can afford. But better than either plan is the judicious combination of the two. They should go hand in hand. Our wish is to keep prominent the fact that of the two the general treatment is the more important in the disease which now concerns us, as it is in many others which we shall come to consider.

Symptoms.—Cervical endometritis may exist for a length of time without presenting any symptoms of sufficient gravity to warn the patient of its presence. Even a leucorrhœa which is somewhat abundant often fails to attract her attention. The answer to a question as to its existence will often be a negative one in cases in which the practitioner will, by the speculum, discover a considerable amount in the vagina. In the great majority of cases the disease will soon announce its existence by some or all of the following signs: The first symptom which will attract attention will probably be dragging sensations about the pelvis. These will soon be followed by pain in the back and loins, which will be very much increased by exercise or muscular efforts. Then a more or less profuse leucorrhœa will be noticed, the discharge as it issues from the vulva resembling boiled starch or thick gum-water, and often irritating the vulva and vagina to such an extent as to produce inflammation in them. Menstrual disorders may now show themselves. The discharge may be either too scanty or too profuse, too frequent or too infrequent, and to a certain extent painful; sometimes, though not often, decided dysmenorrhœa will exist.

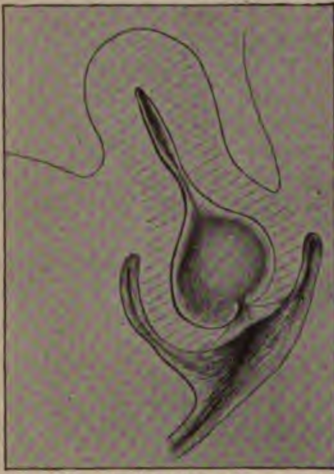
Usually, before the disease has existed for a long period, the constitution of the patient will show signs of becoming implicated. Sh will become nervous, irascible, moody, and often hysterical. Her appetite will diminish and digestion grow feeble, so that impoverished blood will soon be observed as a result of impaired nutrition. With some or all of these signs of the existing disorder the patient may continue for a length of time without suffering from others of more annoying or graver character. Complications may, however, rapidly develop themselves; cystitis, cervical hyperplasia, and vaginitis coming on and proving exceedingly troublesome. At times pain during sexual intercourse constitutes a prominent sign of cervical disease, but it belongs rather to cervical hyperplasia than to endometritis, the former having added itself as a complication to the latter and thus produced the symptom. Sometimes nausea, and even vomiting, present themselves as symptoms, and these, together with the digestive disorder before mentioned, produce a deterioration in the nutrition of the patient.

Although these symptoms are enough to make us confident of the existence of uterine disorder, they by no means furnish reliable grounds for a positive diagnosis. This can be arrived at only by physical exploration.

Physical Signs.—The patient being placed upon her back, and the finger of the examiner introduced into the vagina, the os uteri will probably be found in its usual position in the pelvis, for the weight of the uterus is not increased, the connective tissue not being involved. The os may be somewhat enlarged and its lips slightly puffed, or it may be roughened on account of granular degeneration. Sometimes, however, severe cervical endometritis may exist without enlargement of the os or any trace of abrasion or granular degeneration. If the finger be placed under the cervix and that part raised by it, pain will be complained of, though not to any great extent. This will be most marked opposite the os internum. No other affirmative sign can be elicited by this means, and the speculum should then be used. By this the os will be seen to be in the condition just described, and from it will be found to exude a long string of tough, tenacious mucus which will closely resemble the white of egg. If entangled by a small mass of cotton attached to the end of a whalebone rod, it will be found to be so viscid and resisting that it cannot be drawn from the canal. It will resist even a stream of water thrown with some force upon it, and very often is removed only after several efforts by this or other means. The cervix will usually be found to be somewhat enlarged. Its tissue may present a swollen, puffed appearance, or be intensely red, which will upon close inspection be found to be due to removal of its investing epithelium and the occurrence of hypertrophy of the villi. Should this condition exist, it will afford relief to the mind of the inexperienced gynecologist, for the diagnosis of the case will be clear. But another state of things may be discovered which will leave him in doubt. Upon removing the plug of obstructing mucus he may discover no evidence of disease. The os is no larger than it should be, its tissue is not reddened, no degeneration exists; in fact, nothing is found explaining the backache, nervousness, impaired nutrition, and profuse leucorrhœa which led him to advise and urge the examination. The case is simply one of cervical endometritis, which affects the glands of the canal without abrading the lips of the os.

In nulliparous women the cervical cavity is often very much distended by the accumulation of thick cervical mucus, which is prevented from escaping by a small external os. The cervix then has an elliptic shape quite out of proportion to the size and shape of the body of the uterus. A probe inserted into the cervical canal enters a wide cavity bounded at the lower end by the external and at the upper by the internal os.

FIG. 138.



Dilated Cervical Cavity (diagrammatic).

It is often a matter of great difficulty to decide whether endometritis is confined to the neck or extends through this part into the body. In many cases a certain conclusion is impossible. The evidences by which it may be usually arrived at are these: In the former case the neck alone is found enlarged and tender to touch, conjoined manipulation, and the probe; in the latter the body also shows these signs of implication of its tissues in the morbid action. The discharge resulting in the former is more thick, tenacious, and difficult of removal than in the latter variety. Lastly, the constitutional symptoms attending the latter are ordinarily graver than those created by the former.

Course, Duration, and Termination.—Cervical endometritis is not a self-limiting disease, and consequently its duration will depend upon circumstances which control its progress. It may unquestionably disappear without medical aid. Any alterative influence which exerts a complete change in the economy—as, for instance, parturition, entire alteration of the habits of life, or some change equally decided—sometimes results in a cure. But it is certainly safe to say that unchecked, it frequently passes in multiparous women into cervical hyperplasia, which would probably draw in its train displacement and all the long list of ailments which make the lives of women suffering from uterine disease so burdensome.

Prognosis.—The prognosis of this affection will depend upon the degree of glandular disease accompanying it. If the mucus which marks inflammation of the glands be slight in amount and not very tenacious in character, the prognosis is favorable. When, on the other hand, a large amount of thick, yellow, resisting mucus hangs from the cervical canal, the prognosis, according to our experience, is very doubtful and sometimes hopeless, unless very radical measures be adopted. If every practitioner will look back into his experience, he will see that in all severe cases he has either been forced to resort for their cure to measures which absolutely destroy the diseased glands, or that the patients in time, wearied of his insuccess, have gone for treatment elsewhere. Let it be remembered that we allude now only to very severe cases where the glands are profoundly involved. In regard to such we feel sure that the experience of others must agree with ours.

Even in minor cases great caution should be observed as to fixing the time at which recovery will take place. Even in the mildest case, which has lasted for some time, from four to six months will probably elapse before perfect cure can be accomplished, and even after this a relapse will be very likely to occur unless preventive measures be adopted and strictly adhered to.

Treatment.—The disease consisting in an inflammatory degeneration of the cervical mucous membrane, the efforts of the practitioner should be directed to producing an alterative influence upon that membrane and the avoidance of all influences which may cause it to spread to adjacent tissues. These ends will be best accomplished by the following means:

General regimen;
Emollient applications;
Alterative applications;
Ablation or destruction of the diseased glands.

General Regimen.—So far as this cause has any influence on the production of the disease under consideration, we can say that everything which is calculated to affect unfavorably the general health of the woman should be avoided or removed. Every function of her body should be regulated by the proper means known to those familiar with general medicine. Her hygienic surroundings should be improved. If she lives in damp, badly-ventilated apartments, these should be changed for a more salubrious dwelling. If necessary, vegetable tonics, mineral acids, and preparations of iron should be administered, regular daily exercise insisted upon, and good healthy, nourishing food, with the avoidance of indigestible articles and irritating spices and stimulants, provided for. In particular should attention be paid to proper regulation of the bowels, for which purpose a ferruginous tonic combined with a cathartic may be prescribed, as in the following mixtures:

℞. Magnesiæ sulphatis,	℥ij;
Ferri sulphatis,	gr. xvj;
Acidi sulphurici dil.,	ʒj;
Aquæ,	Oj.—M.

S. One ounce (two tablespoonfuls) in a tumbler of iced water every morning upon rising.

℞. Sodæ et potass. tart.,	℥ij;
Vini ferri amari (U. S. D.),	℥ij;
Acidi tartarici,	ʒiij;
Aquæ,	℥xiv.—M.

S. One ounce in a tumbler of iced water every morning upon rising.

Or, ℞. Massa Blaudi, ʒij;
Pulveris rhei, ʒj;
Aloini, gr. v.
S. Misce fiant pilulæ No. xl. One after each meal.

If there is much disturbance of the nervous system, with insomnia, excessive nervousness, together with loss of appetite, the following well-known prescription, the so-called "black mixture," may be found useful —namely:

℞. Pepsinæ (F. B. & F.), ʒij;
Sodii bromidi, ℥ss;
Carbonis animalis, ʒj;
Aquæ destillatæ, ℥viij.—M.
S. Shake well. One tablespoonful after each meal, and before retiring if there is insomnia.

If the appetite and digestion are disturbed, as is very liable to be the case, a mixture composed of the following will be found to be very beneficial:

℞. Pepsinæ, ʒij;
Acidi nitro-muriatici diluti, ʒiss;
Bismuthi subnitratis, ʒj;
Tincturæ nucis vomicæ, ʒj;
Vini Xerensis excellentissimi, ℥viij.—M.
S. One dessert-spoonful every three hours. Shake well.

As a rule, whenever in cases of this kind the patient is found to be anæmic, neurasthenic, and in need of rest, the treatment indicated for these conditions and laid down in all the good textbooks on general medicine should be recommended.[1]

In former years we were in the habit of employing a number of palliative applications for the treatment of this disease, which, it is true, afforded some benefit, but seldom resulted in a complete or permanent cure. Among these were the familiar alterative applications of tincture of iodine, the iodized phenol, strong nitric acid, solution of persulphate of iron, solutions of nitrate of silver of various strengths, and even the solid stick of nitrate of silver and a strong solution of chromic acid. Undoubtedly, in some of these cases of a recent origin a cure was effected by these remedies, but we have come to the conclusion that in a disease so persistent and difficult of cure as is chronic cervical endometritis when it has existed for any length of time, it is a mere waste of time and trouble to attempt to cure it by the mild and pallative means above mentioned, and therefore during the past few years we have adopted the plan, in every decided case of this disease, of proceeding at once to the one radical means for effecting a permanent cure. We will briefly describe this as follows: In nulliparous women the external os is frequently so small that, as already mentioned, the exit of the excessive cervical mucus is prevented and the disease is thereby aggravated. In such cases we slit the external os by means of scissors or bistoury in four directions to a depth corresponding to the dilatation of the canal. We then excise with fine scissors the four flaps thus formed, and in this way the external os is left of a size equal to the width of the rest of the cervical canal. In women who have borne children, especially if the lips of the external os have been lacerated, it is not necessary thus to open the cervical canal.

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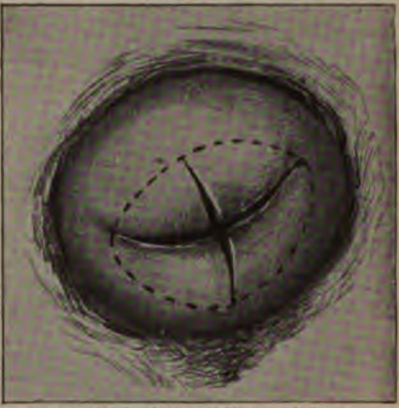
[1] It may be given as a uniform rule, that the above directions for a tonic regimen apply equally to all diseases of the female sexual organs in which the general health of the patient is deteriorated and her nervous system worn out.

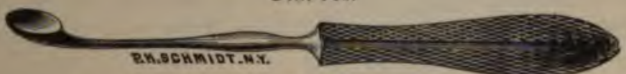
Fig. 139.



Crucial Incision of External Os.

The cervical cavity being freely exposed, we take one of the sharp curettes shown in Figs. 127, 129, and 140, and with it scrape the whole cervical cavity up to the internal os, until we have removed every one of the diseased glands upon which the continuance of the secretion depends. Having thoroughly mopped out the cervical cavity with cotton, so as to remove all blood and secretion and render it as dry as possible, we apply to it the pure nitric acid, being careful to touch every crevice and portion of the cavity. The vagina and the lips of the cervix are protected against an excess of the acid by cotton packed around and under the cervix. The cervical cavity is then packed with a pledget of cotton covered with vaseline or with plain iodoform gauze, and the vagina with a tampon covered with iodoform or with iodoform gauze.

Fig. 140.



Simon's Sharp Curette.

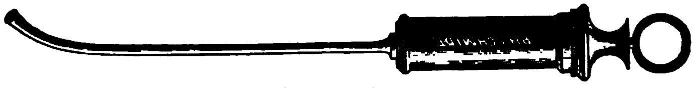
It should be distinctly understood that this treatment is to be looked upon as an operation, and is to be performed only at the patient's residence or at some spot where she can be immediately placed in bed, and if necessary to quiet her nervousness or ease her pain an anæsthetic should be given. After the operation we place an ice-bag over the hypogastric region, and keep it there for at least twenty-four hours, until all risk of inflammatory reaction has disappeared. The tampons from the vagina and cervix should be removed within forty-eight hours and replaced by similar ones, again to be removed in a like time; and when the slough from the cervical canal has separated applications of solution of nitrate of silver, one drachm to the ounce, or iodized phenol should be employed twice weekly until the cervical canal has contracted to a normal size and all abnormal secretion has ceased.

We have found this rather heroic and severe treatment vastly more successful and rapid in its effects than the old-time palliative mild caustic measures which we formerly employed; hence we have not thought it worth while to describe at greater length the latter remedies.

We should not omit the recommendation of the persistent use of the hot vaginal douche given in the classic recumbent position twice daily during this whole treatment, whenever the vagina does not contain a cotton tampon.

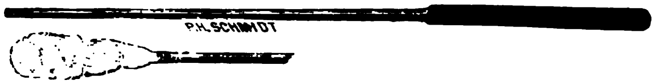
For the removal of the thick plug of mucus from the cervical canal, which it will usually be found difficult to dislodge, we would recommend the syringe with expanded orifice shown in the accompanying cut, and for applications to the dilated cervical cavity after the radical treatment the hard-rubber stick wrapped with cotton depicted in cut Fig. 142 will be found exceedingly useful. In very bad cases which have resisted the above measures the whole cervical mucous membrane, together with the underlying superficial muscular tissue, may be excised and the wounded surfaces brought together by deep sutures, the cervical canal being kept open by a glass or hard-rubber stem.

FIG. 141.



Mucus Syringe.

FIG. 142.



Hard-rubber Stick for Applications to Vagina and Cervix.

CHAPTER XXI.

CHRONIC CORPOREAL ENDOMETRITIS.

LIKE the cervix, the body of the uterus is liable to chronic inflammation confined to its lining mucous membrane. This receives the name of chronic corporeal endometritis.

Synonyms.—This disease has been described under the names of endometritis, uterine catarrh, uterine leucorrhœa, and internal metritis.

Frequency.—Few points in uterine pathology have in former years created more discussion than this. Some excellent authorities regarded it as of rare occurrence, while a large majority considered it quite common. The late Prof. Byford[1] of Chicago, in his excellent work on *Medical and Surgical Treatment of Women*, said: "Inflammation limited to the cavity of the body of the uterus is not common, but I am quite sure that I have met with at least two instances." While Dr. Byford's experience furnishes him but two instances, Dr. Tilt gives the statistics of fifty cases of which he has kept notes, and Klob declares the disease to be quite common.

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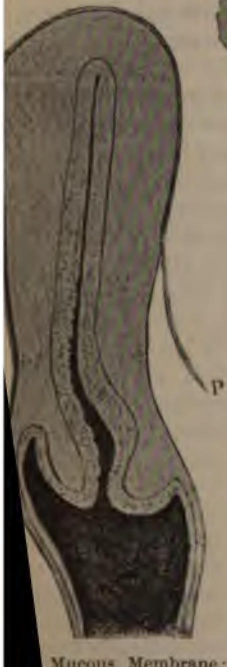
[1] *Op. cit.*, p. 182.

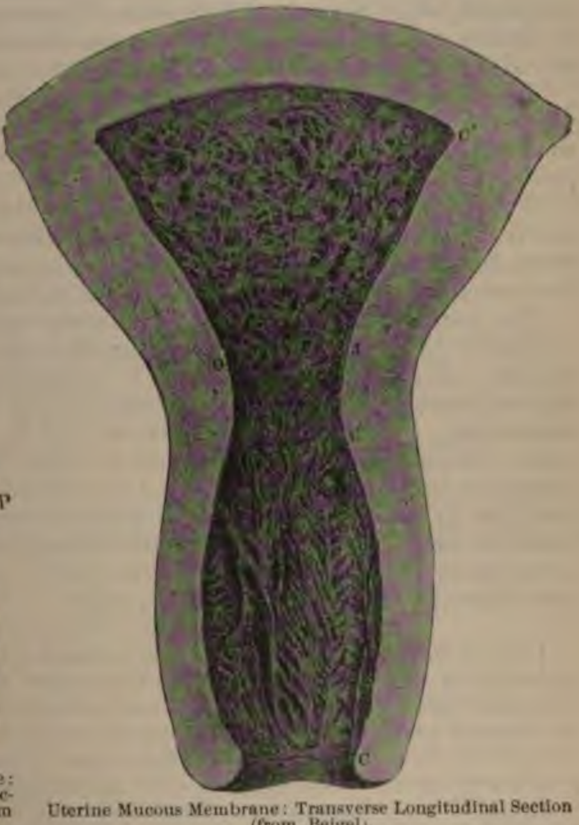
The most frequent locality of uterine inflammation is that portion of uterus below a line running across it through the os internum. The tion of the organ above this line, however, is much more commonly cted by inflammatory disease than was formerly supposed. We our-es meet with what we are compelled from the subjective signs ape of thin muco-serous or muco-purulent secretion from the exter-

FIG. 143.



Mucous Membrane: udinal Sagittal Sec- *P, P,* Peritoneum eigel).

FIG. 144.



Uterine Mucous Membrane: Transverse Longitudinal Section (from Beigel).

and objective symptoms (heat, throbbing, and weight in the bic region) to consider without doubt "chronic endometritis" usually without evidence of involvement of the parenchyma of n—so frequently that we have long since ceased to question, not s occurrence, but have instead marvelled that there could ever n any doubt on the subject. The lining membrane of body ix are often simultaneously affected, and occasionally we find se limited to the body of the organ only. But usually, when tion of the uterus is thus affected, it is the cervix, which part xposed to the causes which produce catarrhal inflammation upper half of the organ.

Anatomy.—If the mucous membrane of the uterus be examined with a lens, it will be seen to be studded with minute openings somewhat similar to the mouths of the glands of Lieberkühn in the intestines. These are the mouths of long, curling follicles, which project by their closed extremities downward toward the parenchyma of the organ. They are lined by delicate ciliated epithelium, their lining membrane consisting merely of involutions of that of the uterus. These glands are of two kinds: the simple, which are unbranched tubes; and the compound, which have several branches. The complex racemose glands or mucous crypts, which sometimes become distended so as to form the so-called "channel polypus," are limited to the cervical cavity.

Between these glands ramify numerous capillaries, which dip down and form a network about their mouths so superficial that they are sometimes seen by a strong glass completely uncovered, and even projecting like villi into the cavity.

Pathology.—Corporeal endometritis is, like the same affection in the cervix, a glandular disease. The utricular follicles are the seat of disorder, and it is to the exaggeration of their secretory function that is due the uterine leucorrhœa which constitutes one of its prominent symptoms.

The post-mortem appearances of the mucous membrane are these: It is found to be swollen, soft, pale, and smooth or covered over with granulations. In cases which have lasted very long the utricular glands are in great numbers obliterated, or, atrophy having taken place at their mouths only, their secretions are retained and they are distended into cysts. In time the mucous membrane is replaced by a thin layer of connective tissue, which is covered not by cylindrical or ciliated epithelium, but by what resembles that of basement character. Frequently numerous small mucous polypi (so-called multiple adenomata) are found in the cavity, while at others, a closure of the os internum uteri having been effected by adhesion, hydrometra exists.

[I have had three opportunities for examining post-mortem into the pathology of this disease. Two of these cases were presented to the Obstetrical Society of this city. In these instances the condition described by Scanzoni was most evident. The uterine cavity was found considerably enlarged, its walls diminished in thickness, and in one instance they were pronounced by Dr. J. B. Reynolds, after microscopical examination, to be in a state of fatty degeneration. The uterine neck was in every case found healthy both as to parenchymatous and mucous structure, and the enlarged body displaced by anterior or posterior flexure. The mucous lining of the body was in two cases quite smooth, and to a great extent deprived of epithelium; while in the third it was roughened, and presented points where the enlarged blood-vessels created a number of reddish spots.—T. G. T.]

But enlargement of the uterine cavity is not always present; it marks chronic cases, and will not be recognized in those of recent origin. It is highly probable, too, that in cases of recent origin the pathological appearances which have been here described would not be found to exist, but in place of them a thickened, congested, and florid appearance would present itself.

Prognosis.—The prognosis of chronic inflammation of the mucous lining of the uterine body is always grave with reference to cure. Even if the case be not of very serious character and have lasted only a short time, the possibility of rapid recovery is doubtful, while, if it have continued for a number of years, it will often prove incurable. Scanzoni[1] says, with a candor which does him honor, "As for ourselves, we do not remember a single case where we have been able to cure an abundant uterine leucorrhœa of several years' standing." In most cases a certain amount of amelioration may be effected even when they are of long standing; in a certain number treated early cure may unquestionably be accomplished; while in a great many nothing whatever, either in the way of cure or of relief, can be obtained, and the patient, after passing from physician to physician, settles down into a careful mode of life, resolved to cease treatment and bear as best she may an evil which she has learned to regard as incurable.

The symptoms of a favorable and an unfavorable case of corporeal endometritis may be thus contrasted:

PROGNOSIS IS FAVORABLE WHEN—	PROGNOSIS IS UNFAVORABLE WHEN—
The case is of recent standing;	The case is of long standing;
The discharge is of mucus or blood;	The discharge is purulent;
Dysmenorrhœal shreds are not cast off;	Dysmenorrhœal shreds are cast off;
Patient naturally of strong constitution;	Patient naturally of feeble constitution;
Connective tissue is not affected:	Connective tissue is affected;
Dimensions of cavity are not increased;	Dimensions of cavity are decidedly increased;
Nervous system is not involved;	Nervous system is involved;
Patient near menopause.	Patient not near menopause.

Predisposing Causes.—It has been noticed most frequently to have developed itself in women showing a tendency to the following conditions:

Scrofula; tuberculosis; spanæmia;
Too frequently-repeated parturition;
Exhaustion from lactation;
Great and prolonged nervous depression.

Exciting Causes.—These may be enumerated as follows:

Exposure during menstruation;
Sudden checking of the menstrual flow;
Obstruction to escape of menstrual blood;
Subinvolution after parturition or abortion;
Cervical endometritis;
Acute endometritis, puerperal or not;
Displacements causing great congestion;
Chronic pelvic peritonitis;
Abuse of sexual intercourse;
Injury from sounds or intra-uterine pessaries, and injuries resulting from attempts to produce abortion;
Certain diseased conditions of the blood, as those accompanying phthisis and the exanthematous diseases;
Tumors in the uterine cavity or walls;
Vaginitis, specific or simple.

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[1] Scanzoni, *Diseases of Females*, Am. ed., p. 202.

It is quite clear how either of the first two causes in checking hemorrhage from the congested mucous lining of the uterine body may at once induce the first stage of the disease. They generally result in the acute variety, which passes off rapidly, but which sometimes ends in the chronic form.

Obstruction to escape of menstrual blood is a very fruitful source of the affection. The menstrual blood, if it pours at once into the vagina, remains fluid from admixture of an acid mucus secreted by the lining membrane of that canal; but if it be imprisoned in the uterine cavity, where only an alkaline mucus exists, it very soon becomes clotted. These clots are too large to pass through a cervix of normal dimensions, and of course cannot escape from one unnaturally constricted. Their presence in the uterine cavity, together with that of blood which they imprison, in time excites contraction, by which they are expelled. This repeated dilatation and contraction cannot last long without exciting inflammation in the mucous membrane of the uterus. Such an obstruction may have as its cause a small polypus which acts as a ball valve at the os internum, congenital or acquired narrowness of the cervical canal, or uterine flexion.

The parturient process is a very frequent source of the disease, especially where the undeveloped placenta is prematurely separated from its uterine connection. Where in a prolonged labor the early evacuation of the liquor amnii leaves the irregular outline of the body of the child pressing against the uterine investment for many hours, such a sequel might result.

We have already stated our belief that a cervical inflammation rarely spreads upward into the uterine canal unless it be of a specific character; still, we will not deny the possibility of that occurrence.

Acute endometritis may, instead of subsiding entirely, very naturally run into this disease.

Subinvolution of the uterus keeps up a constant tendency to hyperæmia of the parenchyma which affects the mucous membrane. Indeed, the latter may take part in the process of deficient involution which affects the uterine parenchyma. As a complication of this condition corporeal endometritis is more commonly observed than as a consequence of all the other causes combined.

Pelvic peritonitis disturbs the position, the innervation, and the circulation of the uterus, and proves a fruitful source of endometritis.

The effect of sexual intercourse as a causative influence is frequently observed soon after marriage, the first connubial approaches exciting uterine congestion with greater or less intensity. This statement applies chiefly to women who, having enfeebled their systems by habits of indolence and luxury, pressed their uterus entirely out of the normal position, and perhaps gone to the nuptial bed with some lurking uterine disorder, the result of imprudence at menstrual epochs, naturally are in no condition for sexual intercourse, and of course suffer in consequence. The taking of food into the stomach exerts no injurious influence on the digestive system, but the taking of food by a dyspeptic who has abused and injured the organ may do so.

Injuries from sounds, etc. act so evidently in exciting inflammation as to need only mention.

Certain conditions of the blood sometimes produce acute corporeal endometritis, which, as already stated, may pass into the form under consideration. As a complication of the exanthematous diseases endometritis is well known, and its occurrence with phthisis has been noted by many practitioners.

Tumors in the cavity or walls of the uterus very generally produce this disease in consequence of the congestion of the mucous membrane which they cause.

Vaginitis of non-specific character may, and of specific form often does, pass by continuity of structure into the neck and body of the uterus. The latter has in these cases in our experience not only affected the body, but the Fallopian tubes, resulting in peritonitis.

Symptoms.—The symptomatology of corporeal endometritis constitutes one of the most unsatisfactory and obscure subjects in the entire field of gynecology. At times its symptoms are so light and at others so masked and obscure that the disease often runs a lengthy course without exciting the suspicions of either physician or patient. Its effects upon the constitution also differ most unaccountably in different cases. Sometimes the disease will continue for ten, fifteen, or twenty years, producing profuse leucorrhœa, menstrual disorders, and nervous derangement, and yet result in no annoyance so grave as to cause the patient to seek medical aid. At others it accompanies or excites areolar hyperplasia, which induces displacement and causes pain on locomotion, sexual intercourse, and the passage of feces through the rectum; or results in an ichorous discharge, which creates the annoying symptoms of vaginitis, cystitis, or pruritus vulvæ. The chief symptoms which usually present themselves in a case of mucous inflammation of the uterine body are—

Leucorrhœa;
Menstrual disorders;
Pain in the back, groins, and hypogastrium;
Throbbing, weight, heat, and bearing-down in the suprapubic region;
Nervous disorders;
Reflex neuroses;
Sterility.

Profuse leucorrhœa of thin, serous, muco-purulent, or muco-serous character is one of the chief signs of the affection. If the secretion is very tenacious and thick, it is the product of the cervical glands only. Very frequently, especially soon after menstruation, the discharge is brownish or rust-colored, and is then most likely to attract the attention of the patient. This is, however, by no means a pathognomonic sign, being met with in cases of retention of fragments of ovum after abortion and in laceration of the cervix. Sometimes the menstrual discharge is regarded by the patient as greatly prolonged, when in reality it is this blood-stained leucorrhœa which follows the process of menstruation that gives rise to the belief. In some instances the discharge is milky, and at others—and these are the most rebellious cases—distinctly purulent. There is a variety of corporeal endometritis which occurs in old women who have long ceased to menstruate, in which a watery or creamy pus is secreted. This is known as the senile form of endometritis. These cases are often accompanied by the most wearing and harassing pruritus vulvæ.

Menstrual disorders are rarely absent. The discharge is sometimes too profuse, even lasting throughout the month and constituting menorrhagia, or it is very scanty and shows a marked tendency to cessation. A characteristic of these cases of scanty and irregular menstruation is, that the women are inclined to grow fat and develop a decided anæmia.

Where the connective tissue is entirely unaffected menorrhagia may occur without pain, but this is not common, for that tissue is often simultaneously involved and dysmenorrhœa coexists. Sometimes in these cases an exfoliation of the entire lining membrane of the cavity of the uterine body occurs at the menstrual periods. This has received the name of the dysmenorrhœal membrane, and is by some regarded as an evidence of chronic corporeal endometritis.

Pain in the back, groins, and hypogastrium is generally present, and at times a burning sensation over the symphysis pubis proves a source of great discomfort.

Nervous symptoms of greater or less severity generally show themselves before the disease has lasted long. The patient complains of neuralgic headache, especially over the crown, hysterical symptoms, with sadness, tendency to weep, and a feeling of intense isolation and incapacity for any mental effort.

Meteorism is a very common symptom, the connection of which with inflammation of the uterine mucous membrane is not at first glance clear. It is probably due to disorder of the nervous influences governing peristalsis and giving tone to the intestinal muscular tissue, which proceeds to such an extent as to result in accumulation of gases in the canal. In the same way this affection may induce constipation, which is often one of its most obstinate accompaniments.

Symptoms of pregnancy often exist in connection with the disease, and sometimes mislead the physician. Nausea and vomiting are by no means invariably present, but are valuable signs. They appear to result from this disease, as they do from occupation of the uterine cavity by the product of conception. Sometimes in addition to these there are darkening of the areolæ of the breasts and enlargement and sensitiveness of the mammary glands. When to these are added abdominal enlargement from tympanites and irregularity of menstruation, it will be perceived how easily an error might be made.

Sterility is so commonly a result of endometritis that it should be considered as one of its signs. Very often it has been the only symptom that has led to an investigation of the state of the uterus which has determined the existence of the disease. The affection does not, however, preclude the possibility of conception; it only diminishes the probability.

Physical Signs.—The physical signs are neither numerous nor reliable. Those of real value only will be mentioned. The uterine probe passed into the cavity will often show the length of the uterus to be greater than it would be in health, and create more discomfort than in a healthy uterus. In addition to the decided increase of pain on probing or sounding the uterus, there is also a much greater disposition on the part of the endometrium to bleed after this manipulation, which is naturally accounted for by the greater vascularity of the mucous membrane. Upon conjoined manipulation, two fingers being placed in the fornix vaginæ and the fingers of the other hand made to depress the anterior wall of the abdomen, sensitiveness will usually be found in the body of the organ. The recognition of the absence of cervical disease, while at the same time there are profuse uterine leucorrhœa and the other symptoms recorded, will lead us strongly to suspect corporeal endometritis. Lastly, dilatation of the os internum may be taken as a corroborative sign. In the absence of cervical catarrh the presence of an erosion of the lips of the external os would also indicate corporeal endometritis.

Diagnosis.—In addition to the subjective signs already referred to (weight, throbbing, bearing down in the hypogastric region, thin, mucopurulent, more or less pungent and irritating leucorrhœal discharge, at times rusty, or sanious secretion), the physical signs are best discovered by ocular inspection through the speculum. They may be recapitulated as eroded lips of external os, thin discharge with above characteristics from the cervical canal, tenderness and ready bleeding on probing or sounding. Unusual tenderness and softness of the body of the uterus on bimanual examination should also be mentioned as a sign.

Course, Duration, and Termination.—This disorder often lasts for years, in the case of a nulliparous woman confining itself to the mucous membrane; in that of a woman who has borne children gradually exciting congestion and exuberant growth in the subjacent parenchyma. This is the most frequent result exerted upon the parenchyma, but it may be affected in two ways: first, a hyperplasia, or excess of nutrition, may occur; second, an aplasia, or want of nutrition, may take place, and dilatation and distension eventuate.

Complications.—The most ordinary complications met with are displacement, vaginitis, and pruritus vulvæ. In aggravated cases a catarrhal inflammation of the Fallopian tubes and a chronic congestion of the ovaries are very likely to accompany the disease of the endometrium.

Treatment.—Special attention should be given to sustaining and improving the general health of the patient, which will often show a marked tendency to depreciation. Good diet, fresh air, systematic exercise, and avoidance of all circumstances calculated to depress the spirits or harass the mind should be recommended. If practicable, change of air and scene should be brought to our aid, and the patient be sent occasionally to some suitable watering-place or country resort. The healthy condition of the nervous and sanguineous systems will be fostered by these measures, and should medicinal tonics be required, iron, the mineral acids, quinine, the bromide of potassium, or nux vomica may be administered. All rich and highly-spiced food should be avoided, and the patient should be guarded against habits of indolence and luxury, which tend to exhaust the nervous strength.

The uterus should be placed at rest by removal of pressure upon the fundus by clothing, limitation of marital intercourse, avoidance of violent and intemperate exercise, and, if necessary, by a sustaining pessary. Should absolute displacement exist, it should be carefully rectified; a laceration of the cervix would call for its repair; and in case uterine enlargement or subinvolution be present, ergot in small doses should be systematically administered.

Applications to the Uterine Cavity.—Upon theoretical grounds direct applications to the diseased endometrium would hold out a brighter promise of cure in these cases than any other plan of treatment, and during the past quarter of a century it has become the conventional habit to recommend them. [In this habit I have shared, until closer observation and enlarging experience during the past five years have led me to become skeptical as to the utility of the course. Observation and experience have so changed my own practice that I find myself very rarely resorting at present to applications above the os internum uteri. That they may become necessary in certain cases I do not at all deny; but I maintain that they should not be habitually resorted to—first, because they very generally fail in curing the disease; and, second, because they are by no means void of danger.

That a certain number of cases of pelvic peritonitis and cellulitis are created by these applications all must admit. In spite of this fact, their use would be decidedly indicated were their results very promising. But in my experience their results are not promising, and for this reason I have given up their general use. I shall nevertheless describe the methods by which such applications should be made as fully as seems necessary.—T. G. T.]

Récamier was the first who had the boldness to cauterize the cavity of the uterus, which he did by means of nitrate of silver in an ordinary porte-caustique. The practice thus introduced was continued and spread abroad by Robert, Richet, Trousseau, Maisonneuve, and others, but to-day the introduction of solid caustics into the uterine cavity is very rarely resorted to. There are four methods by which intra-uterine cauterization may be practised: First, by the use of solutions painted over the surface; second, by ointments left to melt *in utero;* third, by injections of fluid into the cavity of the body; fourth, by solid caustics. In commencing treatment the practitioner should see that the cervical canal is well opened, in order to admit the free escape of fluids from the cavity above and the application of substances through it from below. This perviousness, if it do not exist, should be secured by the use of dilators before the local treatment is proceeded with. If the uterus be found sensitive to vaginal and rectal touch, the patient should remain in bed for some days before the first application is made, the bowels be kept active by mild saline purgatives, and warm baths or hip-baths with copious vaginal injections employed. If the operator use the ordinary long, cylindrical speculum, he will in the majority of cases fail to accomplish the end in view, reaching the fundus uteri, for through such an instrument it is always difficult to penetrate so high into the cavity. If, however, he uses the Sims speculum or one of its modifications, or a short, cylindrical instrument, he will succeed without effort or delay. The instrument being introduced and the cervix cleansed by the mucus syringe, the operator very gently passes through the cervical canal a small and delicate silver or hard-rubber tube attached to a long handle. Through this tube the applications are to be made. This silver tube is not, however, essential, since by careful cleansing of the canal the saturated cotton-wrapped applicator can usually be passed to the fundus, with a fair prospect of carrying in enough of the medicinal fluid to effect the desired object. The usual patulousness of the uterine canal in these cases facilitates this procedure.

Having previously wrapped the silver or hard-rubber probe with a film of cotton, he now passes this up to the fundus. This removes a good deal of mucus from the cavity which would otherwise have neutralized the caustic introduced. Removing the cotton from the probe, he wraps another piece around it, or, as is better, uses another probe already wrapped, and, dipping this into the fluid caustic which he has determined to use, he passes it directly to the fundus and gently moves it over the surface. This should not be repeated, for the astringent action of the caustic makes repetition difficult, and if properly done the first time it will be unnecessary. After this the patient should go to bed, and remain perfectly quiet until the next day at least, and if any discomfort exist for several days.

In place of the cotton-wrapped probe the painting of the uterine surface may be very thoroughly accomplished by the use of a small brush of pig's bristles dipped in the solution and passed through the cervical speculum.

The alteratives which may be thus employed are—

Solution of chromic acid, ʒj to ℥j water;
Solution of nitrate of silver, ℈j or ʒss to ℥j of water;
Compound tincture of iodine, ℥ss to ℥ss of glycerin;
Saturated solution of sulphate of zinc;
Saturated solution of sulphate of copper;
U. S. D. solution persulphate or perchloride of iron with equal parts of glycerin;
Solution of chloride of zinc, ʒj to ℥j water;
U. S. D. muriate tincture of iron, ʒij to ℥j water;
Concentrated solution of carbolic acid.

Ointments.—Medicated ointments have been employed by various physicians to the uterine cavity, but have now fallen completely into disuse. They have no special advantage over fluids, and are much more troublesome to apply.

Solid applications to the endometrium are also but seldom used at present, the old practice of pushing pieces of nitrate of silver into the uterine cavity, and leaving them there to melt, being both too painful and dangerous, and besides likely to cause undesirable cicatricial contraction of the uterine canal. The same objection applies to the cauterization of the endometrium with nitrate of silver fused on a silver probe.

Intra-uterine pencils containing zinc, copper, alum, or iron in substance, and kept suspended by the addition of tragacanth or cacao butter, were also formerly used.

Injections into the Uterine Cavity.—In the last edition of this book we devoted several pages to a careful review of the history, indications, and counter-indications of this method of treating catarrh of the endometrium, and we will refer the reader who may feel interested in the subject to that chapter. Since then this practice has fallen almost entirely into disuse, and it is hardly worth while at the present day to spend very much time or labor on its description. Suffice it to say that intra-uterine injections were employed as long ago as in the year 400 B. C. by Hippocrates, and they are advised by numerous writers of different countries even down to our time. While the dangers of these injections, consisting mainly in uterine colic, severe shock, prostration, pelvic and general peritonitis from escape of the fluid into the peritoneal cavity through the Fallopian tubes, were recognized by the earlier authorities, there were still numerous advocates of the method, notable among whom were Récamier, Velpeau, and Ricord in France; Routh, Matthews Duncan, and Tilt in England; Siegmund, Braun, and Martin in Germany; and Nott and Kammerer in this country. In course of time, however, so many cases of dangerous symptoms, and even death, following the treatment were reported that its opponents ultimately by far outnumbered its adherents. Fatal cases of peritonitis have occurred to Brétonneau, Nélaton, Gubiau, Noeggerath, Haselberg, Jobert, and others, and the cases of dangerous peritonitis ending in recovery which have been produced in this manner are too numerous to mention. The dangerous results of intra-uterine injections appear to be due not so much to the character of the fluid employed as to forcible dilatation of the uterine cavity on the one hand, even though apparently no force was used and the quantity of fluid injected consisted of but a few drops, and to the undoubted occasional passage of the fluid through the Fallopian tubes. It was thought, therefore, that if the uterine canal were widely dilated, so that the fluid could escape freely from the external os as soon as it was injected, both the colic and shock produced by the distension of the uterine cavity and the entrance of the fluid into the tube could be avoided; hence the more recent adherents of this method made it a universal rule that the uterus should first be dilated by tents or divergent dilators, so as to permit the injected fluid to escape immediately after its introduction. Undoubtedly, many accidents have been and can be avoided by a careful observance of this precaution; and it is for this reason that some of the German authorities still recommend and practise intra-uterine injections. The late Prof. Schroeder, we know, employed it, and B. Schultze, Martin, and Winckel still make frequent use of it. We, for our part, while never fearing to irrigate thoroughly with plain water or mild medicated solutions the interior of the puerperal uterus, confess that we have not had the boldness, in view of the many unpleasant experiences of others and the few of our own, to continue irrigation or injection of the non-puerperal uterine cavity. We regret having been obliged to arrive at this conclusion, since there is no other equally efficient and thorough method of applying medicated solutions to the interior of the uterus.

Having thus stated our objection to this form of treatment, we will spare the reader the details given in our last edition as to how such injections are to be used and what solutions should be employed.

It may now be asked, since we oppose the habitual practice of carrying applications above the os internum uteri as well as that of injecting the uterine cavity, what course we do advise and adopt in the management of this affection. As we have already stated, we would recommend careful attention to the general state, removal of displacements, cure of laceration of the cervix, extirpation if possible of any existing neoplasm, and, if uterine enlargement exist, the free use of ergot. To favor the free escape of mucus from the uterine cavity we would see that the cervical canal be dilated. And now, if improvement did not occur, we would apply the dull wire curette freely over the whole surface. In speaking of the pathology of corporeal endometritis it was stated that the diseased membrane in time develops upon its surface fungoid granulations, mucous cysts, and mucous polypi. These secondary conditions often result in metrorrhagia or menorrhagia. Not only does the gentle application of the little wire curette without cutting edge accomplish the removal of these, but it produces, when thoroughly applied, an altered state in the entire endometrial membrane, breaks distended blood-vessels, and often accomplishes a great deal for the relief of the disease. In cases of endometritis engrafted upon subinvolution and accompanied by hemorrhage it is especially applicable. But its beneficial results depend, we feel sure, upon the fracture of tortuous and distended blood-vessels, and it is chiefly for this purpose that we use it.

The use of the dull wire curette does a greater amount of good in these cases at the expense of less risk than the applications just mentioned, and we infinitely prefer it.

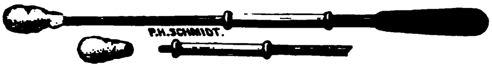
[With the exception of condensing the portion of the present chapter relating to the treatment of chronic corporeal endometritis, especially that treating of intra-uterine injections, I have substantially retained the views of the author, with which to a great extent I perfectly agree; but I am not willing to place myself on record, in the light of my own personal experience, as sharing the sweeping condemnation which he has passed upon the intra-uterine treatment of this disease by chemical agents. I admit that in the absence of intra-uterine irrigation with medicated fluids, and of the introduction of solid chemical agents into the uterine cavity, the remaining methods of intra-uterine medication by no means offer us the ideal treatment for uterine catarrh. The reason for this failure is chiefly the impossibility of making thorough applications of fluids to the interior of an undilated uterus, since the fluid introduced on applicators of metal or hard-rubber wrapped with cotton is mostly squeezed out, and thus very little of it really reaches the uterine cavity proper in the majority of cases in which such applications are made. It is true, we might dilate the uterine cavity, and thus be enabled to thoroughly apply the medicinal agent to every portion of it, but as the majority of cases of chronic endometritis come to our offices for treatment, and as dilatation of the uterine canal sufficient to allow its thorough treatment is not feasible or safe in the office, and further, as but few such patients would be willing to undergo the confinement to bed and the thorough radical treatment then to be employed, considering with some justice that the treatment was worse than the disease, we are unfortunately unable to give a large proportion of such cases the benefit of the best means at our disposal; and still I have seen so many cases of chronic endometritis with subinvoluted hyperplastic uteri in which I have been enabled, by a persistent course of intra-uterine applications of tincture of iodine or tincture of iodine and carbolic acid equal parts, through a period of several months, to relieve the most distressing symptoms at least, if not cure the endometritis permanently, that I should feel sorry to be compelled to give up this method of treatment unless something equally beneficial and not more troublesome were substituted. I see no reason why the mucous membrane lining the cavity of the uterus should not be treated on a similar principle as that clothing the throat, nares, male urethra, rectum, or other accessible cavities of the body; and no one will deny that topical applications of astringents or caustics, alteratives, or styptics exert a most beneficial, and even decidedly curative, effect on these mucous tissues. The question in the uterus seems to me simply to be one of rendering the endometrium accessible to the application. My plan in severe cases of chronic endometritis has been briefly the following: If the patient can be induced to spend a few days or a week even in bed, I have, if necessary, given her an anæsthetic, placed her in Sims's position, and through Sims's speculum have under proper aseptic precautions scraped her endometrium carefully, but thoroughly, with the blunt curette, or at times even with the sharp curette, having first dilated the canal with Palmer's dilator; I have then mopped it dry by means of a cotton-wrapped applicator, and have then applied on a similar applicator a solution of chloride of zinc of a strength of 50 per cent. to the whole endometrium; and I have repeated this same application two or three times, if necessary, until all oozing had stopped. I then introduce a cylindrical wad of cotton covered with iodoformed vaseline into the uterine cavity, to effect separation of its walls, and place an iodoform tampon over the cervix. The patient is put to bed, an ice-bag is kept over the hypogastrium for twenty-four hours or as long as pain exists. After forty-eight hours the tampon is removed from the vagina and the uterus, and douches of hot water are given twice daily in the usual fashion. If all pain has subsided, the patient is allowed to leave her bed toward the end of a week, and future applications of a solution of 20 per cent. chloride of zinc are made once every week or ten days at the office. From three to six of these applications will usually bring about such a revolution in the nutrition of the uterine mucosa that a fresh and healthy membrane will take the place of the one that was diseased and destroyed. If necessary, however, milder applications of a solution of nitrate of silver, one drachm to the ounce, may be continued once or twice a week for several weeks. When vegetations were present in the endometrium they were of course removed by the curette as described, and if menstruation had been very profuse, in place of the chloride of zinc I have found the iodized phenol or compound tincture of iodine, applied in the same manner, very useful. These applications should be repeated more frequently than those of the zinc—that is to say, about twice a week. In the treatment of chronic endometritis of a milder type, in which the patients could not be induced to undergo this more severe if more efficient treatment, I certainly have seen a decided benefit result from the use of intra-uterine applications of iodized phenol, tincture of iodine, or carbolic acid and glycerin equal parts. Even if the endometritis was not much benefited, not to speak of cure, the applications by their stimulant and alterative effect upon the uterus, in my opinion, certainly relieved congestion of that organ and tended to diminish subinvolution and hyperplasia. Where there was much discharge, but no particular tenderness, or where there was a tendency to profuse menstruation, I have found pencils containing five grains each of powdered alum and iodoform covered with gelatin very useful. It is important, of course, that the gelatin should be soft and the pencils always flexible, so that they will melt very soon after their introduction. I have had them made by Robert E. Fleischer of Seventy-first street and Second avenue, and I believe Parke, Davis & Co. furnish a similar article. Unfortunately, so far, the chemists who experimented with the manufacture of these pencils have not been able to make them for me with iodine or carbolic acid or iron, so as to ensure the gelatin retaining its softness and solubility. I insert these pencils into the cavity of the uterus proper by means of a piston tube, and retain them by a tampon placed against the cervix.

Some years ago I thought I had found the ideal method of making applications of fluids in the uterine cavity. The syringe which I had made for this purpose was composed of hard rubber, with a fine uterine tube two inches in length with numerous small perforations. The plan of this syringe was not original with myself, a similar one made of silver for intra-uterine injections having been shown me at the instrument-maker's as the invention of the late Dr. F. D. Lente, but I believe my plan of using it was original; at least it was so with me. The syringe was filled with the solution to be employed, usually iodine or carbolic acid or one of the other applications (I have even applied nitric acid in this manner), and then the uterine tube was wrapped with a thin film of absorbent cotton and the syringe introduced into the uterus through a speculum. By gently propelling the piston with a very slow rotary motion the fluid was gradually forced into the cotton, which became thoroughly saturated with it and necessarily touched every portion of the endometrium. There could be no doubt of the entire thoroughness of this method of application. Any excess of fluid readily flowed out of the external os, but by previous experimentation it was easy to ascertain exactly how far the piston should be advanced in order to saturate the cotton, so that anything like the forcing of an excess of fluid into the cotton, which would practically resemble an injection, could be avoided. I used this method many times with great satisfaction, and without either immediate or subsequent bad results, until once, making an injection of a solution of nitrate of silver, one drachm to the ounce, the patient was seized, quite unaccountably in my opinion, with severe uterine colic and shock, fortunately of merely temporary duration; but when this same accident had happened to me three or four times in different patients, in one case requiring a hypodermic of morphine and the conveyance of the patient to her home in a carriage and rest in bed for several days, with symptoms of threatened peritonitis, I confess that I began to mistrust the entire safety of the practice, no matter how much confidence I might have in its efficiency, and I gradually gave it up, so that during the last few years I have no longer employed it, but have returned to the old-fashioned method of application described above. From this I have, to my recollection, never seen any bad results.

In some cases quite severe hemorrhage follows the use of the curette, even the dull instrument, and at times we find a soft, spongy, subinvoluted uterus so liable to bleed from the mere introduction of the sound or probe that it seems unsafe to allow the patient to return home without providing against a continuance or return of the bleeding. In such cases I have frequently resorted to the tamponade of the uterine cavity, inserting a conical wad of cotton soaked in a solution of liquor ferri subsulphatis and glycerin, equal parts, or of compound tincture of iodine, into the uterus by means of a slide applicator (see Fig. 145); and I have either removed it myself after twenty-four or forty-eight hours or enabled the patient to withdraw it by means of a string tied around it. I should be sorry to be obliged to dispense with this method of treatment in appropriate cases.

In addition to the intra-uterine applications, I always follow the author's recommendations as to the attention to the general health, removal of displacements, and, in fact, the treatment and if possible cure of the uterine and pelvic congestion. For that reason regulation of the bowels, moderate exercise in accordance with the rules governing intra-uterine treatment (that is, on the day of such treatment I usually enjoin patients to take very little if any exercise, and at once on returning home to rest for an hour or two or as long as pain persists), abstinence from marital intercourse, the use of iron with or without ergot, massage, etc., form the routine measures which go hand in hand with the local treatment. Without these, no doubt, many a case of chronic endometritis in which the original cause of the catarrh is more of a constitutional than of a local nature would remain uncured; but I am confident that the reverse is equally true, and that very many cases would resist all general measures unless the local condition upon which the continuance of the catarrh depends is removed by appropriate local treatment.—P. F. M.]

FIG. 145.



Slide Applicator for Tamponade of Uterus.

CHAPTER XXII.

AREOLAR HYPERPLASIA OF THE UTERUS—THE SO-CALLED CHRONIC PARENCHYMATOUS METRITIS.

Definition and Nomenclature.—One of the most common pathological combinations which confronts the gynecologist is that which we here endeavor in as concise a manner as possible to picture. A patient calls upon him for relief of backache; pelvic pains; dragging sensation about the loins; "bearing-down pains;" leucorrhœa; menstrual disorder, tending chiefly to excessive flow; throbbing sensation about the uterus; general feeling of despondency; malaise and weakness; and irritability about the bladder and rectum. All these rational signs pointing to the uterus as the probably delinquent organ, a physical exploration is made, and furnishes the following results: The uterus is usually discovered to be in the condition of descent, retroflexion, or anteflexion; it is voluminous, tender to the touch, and evidently engorged with blood; from the cervical canal a thick, viscid or a thin, yellow muco-purulent discharge pours; the probe carried to the fundus finds it tender and creates the flow of a little blood; the lips of the external os are eroded and rough, and a low grade of vaginitis exists.

To this pathological combination the more superficial diagnostician will often apply a name which announces one only of the existing conditions, as, for example, uterine catarrh, ulceration of the cervix, or retroversion or prolapse. The more reflective and intelligent examiner will ordinarily group the coincident morbid states together under the name of "chronic metritis."

The latter would be fully sustained in his position by authority as abundant as it is orthodox, for by systematic writers, since the days of Récamier, this uterine state has been described as one of "chronic parenchymatous metritis." Only within a recent period have the pathologists of the German school begun to question the validity of this conclusion, which, taking its origin in France, was spread through England and America chiefly by the writings of Dr. Henry Bennet. According to this view, the following pathological changes were believed to be those resulting in the condition just described: In the first stage the parenchyma was regarded as gorged with blood, a state of active congestion existing. This was supposed soon to pass into the second stage, consisting in an effusion of lymph, when, unlike a similar process in other parts, the morbid action ceased, or rather did not advance, and unless relieved by treatment continued stationary for a length of time. The third stage of inflammation in other parts—that of suppuration—was admitted to occur rarely here or in the parenchyma of the body, but in time, all inflammatory action ceasing, the cervix remained large and indurated without sensitiveness, or the effused lymph might be absorbed and great diminution in size occur with induration. Were this really the case, the condition would constitute one of inflammation, even if we restricted ourselves in the use of that ambiguous term to the narrow and precise limits prescribed by Dr. J. Hughes Bennett when he says: "It should be applied only to that perverted alteration of the vascular tissues which produces an exudation of the liquor sanguinis; it is this exudation alone which can be held to unequivocally characterize an inflammation."

Examined more recently, however, by the more certain and less theoretical processes of modern science, all this has come to be looked upon as erroneous. Cases which were formerly regarded as instances of inflammation on account of the existence of enlargement, congestion, and tenderness upon pressure, the microscope now proves to have been instances of excessive growth of the connective tissue of the uterus, with congestion, and resulting hyperæsthesia of its nerves.

It may result from three entirely different pathological states: first, from interference with retrograde metamorphosis of the puerperal uterus from any cause; second, from congestion long kept up by mechanical causes, such as displacement; third, from a formative irritation or state of hypernutrition excited by endometritis or the existence of fibrous tumors. Whatever be the originating pathological condition, that which results and which we are now considering consists in hyperplasia of connective tissue as its most marked feature, and of congestion and nervous hyperæsthesia as important accompaniments.

It is true that some progressive writers still cling to the name chronic inflammation, and apply it to hyperæmia resulting in hypergenesis or hypertrophy of connective tissue, but this is by no means the signification which is ordinarily given to the term. Indeed, with reference to the uterus so vague and unsatisfactory is the appellation "chronic metritis" that there is no knowing what idea one who uses it really intends to convey.

Everywhere throughout the recent and progressive literature of gynecology the foreshadowing of the advancing change in views with regard to this subject will be recognized. The pendulum, swung too far by the hand of Dr. Henry Bennet, is making its inevitable return. That it may stop on safe middle ground must be the hope of all. "The determination of blood to a part here noticed, characterized by dilatation of the arteries, with increased flow of blood through the capillaries, must be distinguished from the congestion of inflammation, characterized by the accumulation and stagnation of red and white corpuscles in the vessels, tending to be abnormally adherent to each other and to the vessels," says Dr. H. G. Wright,[1] quoting from Dr. Aitken. "Tested by this standard," says Dr. Graily Hewitt,[2] "the uterus is certainly very little liable to 'inflammation;' exudations, and transformations of such exudations, purulent and otherwise, similar to what may be witnessed in other organs of the body, being very rarely witnessed in the parenchyma of the uterus. The morbid processes with which we are familiar as affecting the tissues of the uterus are for the most part alterations of growth, irregularities in growth—slight modifications, in fact, of the processes which follow each other in due succession in the natural condition of things. The word 'inflammation' certainly fails to convey an adequate idea of the modifications observed under such circumstances." "Diffuse growth of connective tissue," says Klob,[3] "constitutes the so-called induration hitherto considered as a result of parenchymatous inflammation of the uterus. . . . . For reasons mentioned I would also advise a disuse of the term 'chronic inflammation.'" Dr. Peaslee preferred "to call the disease under consideration congestion, rather than inflammation, because it has none of the events of inflammation;" and Dr. Kammerer expressed the view that "chronic inflammation of the substance of the non-puerperal uterus is never met with; what has been described as such is hypertrophy of connective tissue resulting from long-continued hyperæmia."

These views, which among men who are in the advance in gynecology are rapidly gaining ground, are not sustained by analogical reasoning, but by anatomical proof. We know of nothing which will more surely convince the reader of the necessity for an alteration in our nomenclature concerning this condition than a perusal of Scanzoni's[4] article upon it. This author, after heading his chapter "Chronic Parenchymatous Inflammation of the Womb," goes on to say: "The nature of the disease would then be, in an anatomical point of view, an hypertrophy of the cellular tissue." Certainly the "anatomical point of view" is an important one, and it is supported by what we observe from a clinical standpoint.

So much evil has arisen for pathology and treatment from the use of the term "chronic metritis," and so clear a demonstration has been made that the condition so called is not one of true inflammation, that some other appellation is not only desirable, but has become absolutely essential. It is incontestable that there is a peculiar condition that affects the uterus which is characterized by distension of blood-vessels from vital or mechanical cause, effusion of the serum of the blood, and hypergenesis of connective tissue. To denote this state gynecologists have long required a name, for medical nomenclature is as necessary as it is faulty. Lisfranc felt this need when he styled it "engorgement;" Hodge, when he entitled it "irritable uterus;" Bennet, when he called it "metritis;" and others also have acknowledged the necessity, Klob, for example, in "habitual hyperæmia" and "diffuse proliferation of connective tissue," and Kiwisch in "infarctus."

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[1] *Uterine Disorders*, p. 218.

[2] *Dis. of Women*, p. 363.

[3] *Op. cit.*, p. 129.

[4] *Dis. of Females*, Am. ed., p. 181.

The appellations "infarctus," "engorgement," and "hyperæmia" only convey a partial idea of the truth; they only announce one element of the condition—congestion; while that of "irritable uterus" ignores all structural change in announcing another element—nervous hyperæsthesia. At the same time that the phrase "diffuse proliferation of connective tissue due to hyperæmia," which is employed by Klob, clearly defines the pathological condition, it is too long and burdensome to answer the purpose of a name to be conventionally employed. If there be a term now in existence which does really convey the idea truly and completely, it should surely, in the interests of pathology and treatment, as well as out of consideration for the overburdened student of medical nomenclature, be employed in preference to the adoption of a new one. Enlargement of an organ due to formation of new cells similar to those of the tissue in which they are developed has been styled by Virchow hyperplasia, in contradistinction to hypertrophy, which consists in increase of size from distension of cells already existing. As the condition of the uterus now under consideration is one arising from over-excitation of the vaso-motor and excito-nutritive nerves, a "formative irritation," as Klob styles it, and resulting in a numerical hypertrophy, it appears to me that the term "areolar hyperplasia" would more correctly designate it than any other with which I am acquainted. With a sincere desire to lessen and not to increase the labors of the student and the perplexities of the gynecologist, we shall therefore replace the confusing term "chronic metritis" by that of ***areolar hyperplasia*** of the uterus.

That the term is faultless we do not claim. To one unaccustomed to it it must even appear peculiar. We have merely to ask for it a favorable consideration on the grounds that it is faithfully descriptive of the condition to which it is applied, and that a decided necessity for some such term exists.

In a very fair critical review[1] of the third edition of this work the reviewer remarks that this name "involves the notion that the connective-tissue elements alone hypertrophy, and disowns the muscular element as the one most readily provoked to increase. We do not deny that in the disease in question there is hyperplasia of connective tissue, or, at any rate, of non-muscular elements; but we must aver our belief that concomitantly there is increase in the muscular elements also." At first glance this appears to be a very strong point of objection; but we think that even the writer himself will, upon more careful examination of the views of pathologists, agree that they look upon the proliferation of areolar tissue as *always* the characteristic or highly predominant feature of the condition, and regard muscular growth as an insignificant accompaniment only. For obvious reasons it is impossible for us to quote largely to sustain this position, and we confine ourselves to the statement of Professor Klob,[1] who in speaking of this condition expresses himself in the following terms: "The whole uterine connective tissue sometimes proliferates, either without accompanying increase of the muscular substance, or, if this does occur, the connective tissue predominates to such an extent that the muscular substance is comparatively of not much account."

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[1] *Brit. and Foreign Medico-Chirurgical Rev.*, Jan., 1873.

It is true that while most who have investigated this subject have found, like Klob and Scanzoni, a great preponderance of connective tissue and an insignificant increase of muscular elements, some have declared that the muscular structure is greatly hypertrophied. One reason for this variance of opinion is this: the most prolific source of areolar hyperplasia, the so-called chronic metritis, is interference with involution of the parturient uterus. What begins as subinvolution ends, in time, in a condition ordinarily styled chronic metritis. He who examines early will probably find a greater amount of muscular elements than he who does so later; and let it be remembered that by continental writers, with one exception,[2] no recognition is made of subinvolution as a disease distinct from what Chomel styled it, post-puerperal metritis. In this way we reconcile the researches of Klob, whose statement we have quoted, with those of Finn,[3] who reports the following observations, made at the Institute of Pathological Anatomy in St. Petersburg:

"1. The normal disposition of the single muscular fibre, as well as of the muscular bundle, remains unchanged.

"2. The muscular fibres do not change in quality, neither is their fatty degeneration a pathognomonic sign of this disease.

"3. The muscular fibres are always extended in both their length and breadth above their normal standard, but more so in the former direction.

"4. The number of fibres is always largely increased.

"5. The amount of connective tissue in the latter stage of the disease is always relatively diminished, but absolutely enlarged, so that the increase of bulk of the uterus is mainly caused by the hyperplasia of the muscular fibres, the augmentation of the connective tissue influencing it but little."

If the disease really consists in a proliferation or hypertrophy of the areolar or connective tissue of the uterus, and not in chronic inflammation, it would certainly be advantageous to apply to it some name which would signify that fact. "Areolar hyperplasia"[4] expresses this fact concisely, and hence we have employed it.

Pathology of Areolar Hyperplasia.—The vast majority of cases are due to interference with that retrograde metamorphosis occurring in the puerperal uterus styled involution. To comprehend the pathology of cases thus arising it will be necessary to consider the physiology of that process as well as the pathological conditions which may affect it.

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[1] In the American translation of Klob the rendering is not this; but Dr. Kammerer, the translator, informed us that that passage is not correct, but that this is.

[2] M. Courty.

[3] *Am. Journ. Obstet.*, vol. i. p. 264.

[4] Hypertrophy signifies excessive growth of the elements of a tissue already existing; hyperplasia signifies the development of new tissue.

It is only within the last quarter of a century that we have understood the process by which the uterus, an organ measuring three inches, in the short space of nine months enlarges so as to contain a child or even two or three children, and then within two months after delivery undergoes so rapid an absorption as to return to its original size. The credit of elucidating the subject belongs chiefly to Germany, for it is to Virchow, Franz Kilian, Heschl, Kölliker, and Retzius that we are most indebted.

The important pathological fact that arrest in or disturbance of this process constitutes a condition of disease emanated from Sir James Simpson, who in 1852 published the first article which drew especial attention to it. His article was entitled "Morbid Deficiency and Morbid Excess in the Involution of the Uterus after Delivery." Since that time the condition which now engages us has become generally recognized as a uterine state of great frequency and moment.

To fully comprehend this part of our subject it is necessary to bear in mind the component parts of the healthy uterine parenchyma. It consists of five elements: 1st. Fusiform fibre-cells, or, as they are termed, the smooth muscular fibres; 2d. Round and oval nuclei, which are supposed to be elementary fusiform fibre-cells; 3d. Amorphous or homogeneous connective tissue, which permeates the parenchyma and binds together the fibre-cells and nuclei; 4th. Fibrillated connective tissue or white fibrous tissue; and 5th. Elastic fibrous tissue. These elements, together with nerves, blood-vessels, and lymphatics, make up the tissue of the uterus, which is covered by a serous membrane externally and a mucous membrane within.

No sooner does this structure feel the stimulus of conception than it develops rapidly, partly by growth of already existing structures and partly by new formations. The round or oval nuclei rapidly develop into fusiform cells, and these as rapidly grow into colossal cells, which grow longer and more powerful as pregnancy advances. "A new formation of muscular fibre also takes place;"[1] the connective-tissue elements grow proportionately and the blood-vessels enlarge.

Parturition occurs, and almost immediately a retrograde evolution begins to restore the uterus to its original constituency. The fully-developed fibres undergo a fatty degeneration; the fat thus formed is absorbed, and the organ rapidly diminishes in size and weight. This fatty degeneration affects the organ after the fourth day subsequent to delivery, and, according to Heschl, the commencement of a new formation of muscular fibres is recognized in the fourth week after labor, in the form of nuclei and caudate cells. At the end of the eighth week the uterus has returned to its normal state.

Certain untoward influences may retard or check this process and the uterus remain flabby and large, when it is said to be in a state of subinvolution or arrested retrograde evolution.

Thus far, we have been dealing with facts thoroughly ascertained by histological investigations and fully established by evidence yielded by the microscope. But from this point the pathology of subinvolution is not so satisfactorily settled. Prof. Simpson declared that the disease was due to the fact that "this retrograde metamorphosis of the uterus has not taken place during the puerperal month, or has taken place only to such an imperfect degree that the uterus is of the size we usually see it have at the end of the first week or so after delivery;" but he entered, if we may judge from the posthumous volume of his work upon *Diseases of Women*, upon no detailed account of the existing pathological defect in the organ. Since his writing it appears to have been agreed upon that this consists of persistence of the muscular fibres characterizing pregnancy in a state of fatty degeneration. Thus Dr. Wright[1] says: "Pathologically, it closely corresponds with that state of the heart-structure so admirably described by Dr. Richard Quain, and commonly known as fatty degeneration." Dr. West[2] expresses himself thus: "Though fatty degeneration of the tissues takes place, yet the removal of the useless material is but imperfectly accomplished, while the elements of the new uterus are themselves, as soon as produced, subjected to the same alteration." We search in vain the literature of the pathology of this subject for a basis for these hypotheses. That literature is scanty in the extreme as yet, and the subject awaits extended researches before we can speak intelligently of it. The day has passed, however, when we can let probabilities in pathology pass current for facts.

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[1] Arthur Farre, *Cyc. Anat. and Phys.*, article "Uterus."

The best, indeed we may say the only, detailed account of this condition studied by the microscope which we have been able to obtain is one by Dr. Snow Beck[3] of London: "The enlargement of the uterus did not depend so much upon an increase in the size of the contractile fibre-cells as upon an increased amount of round and oval globules, with amorphous tissue in the uterine walls. . . . . The essential condition of the organ consisted in the elements of the different tissues retaining a portion of the natural enlargement consequent upon impregnation. But this enlargement was more due to the increased size and amount of the soft tissue present in the walls of the uterus, as well as at the internal surface, than to the increased size of the contractile fibre-cells." Marked congestion existed, the blood-vessels being large and forming a complete and continuous system with the capillary network on the inner surface of the uterus. No allusion to preponderance of muscular fibres is anywhere made, and no mention of fatty degeneration occurs.

The condition of the uterine cavity is important. It is always increased in size, the glands of the cervix are usually enlarged, and upon the lining membrane of the cavity fungoid growths are commonly developed.

This is all that can with positiveness be said of the pathology of the early periods of subinvolution in the present undeveloped state of the subject.

The uterus, the study of the tissues of which gave Dr. Beck's results, measured 3½ inches in length, 2¼ inches across the fundus, the walls were 1⅜ inches thick, and the uterine canal was 3 inches deep.

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[1] *Uterine Disorders*, p. 221.

[2] *Dis. of Women*, 3d Eng. ed., p. 89.

[3] *London Obstetrical Trans.*, vol. xiii. p. 239.

As time passes the uterine walls diminish in size, their tissue grows less vascular, the blood-vessels become smaller, and the uterine cavity assumes smaller dimensions. But the organ does not assume its original size: it remains large, dense, firm, and sensitive, for years presenting the characteristic appearances of the so-called chronic parenchymatous metritis. Although taking an entirely different view of the pathology of chronic metritis, Dr. West[1] signalizes almost the same fact in the following words: "It must, however, be at once apparent that after inflammation has passed away its effects may remain in the larger size and altered structure of the womb, and that the very nature of these changes will be such as to render the repair of the damaged organ both unlikely to occur and slow to be accomplished, and must leave it in a condition peculiarly liable to be aggravated during the fluctuation of circulation and alternations of activity and repose to which the female sexual system is liable." This is just the state to which we alluded at the commencement of this chapter as one existing years after labor, and which, attended by congestion, displacement, catarrh, and granular degeneration, is styled chronic metritis. It is, we think, this state which most frequently furnishes instances of areolar hyperplasia to the microscope.

Let any one faithfully and patiently watch a case of subinvolution for a year or two with reference to this point, as we have repeatedly done, and we cannot doubt that he will have the same evidence which makes us so strong in our present belief. Lastly, let it be remembered that by the French school no condition of arrest of development is recognized as accounting for it; these are cases of "post-puerperal metritis"—metritis, according to M. Gallard,[2] without symptoms, "chronique d'emblée."

Does any one claim that between this condition and chronic metritis a difference should be made? Let him tell me by what means he can at the bedside distinguish one from the other, and I may agree with him. There are no means for such differentiation. If the uterus be very large and the patient recently delivered, the case is termed subinvolution by English writers; if its dimensions have diminished, years have elapsed since parturition, and the almost universal accompaniments of the condition, leucorrhœa, granular degeneration, and displacement, be present, it is styled chronic metritis.

Arrest of involution of the puerperal uterus is an occurrence of very great frequency. It constitutes the chief cause of all chronic uterine disorders, and for this reason its importance cannot be overestimated. Until this subject receives the attention which it deserves, the present confusion as to the causes, pathology, and general features of chronic metritis, which helps to weaken uterine pathology, must continue.

As a very general rule, areolar hyperplasia, the so-called chronic metritis, is a consequence of subinvolution. This constitutes the explanation of the fact that so large a number of women with uterine affections refer their illness to child-bearing, and that so many who are well until that process remain invalids afterward. Go back to the commencement of all cases of uterine disease, and a very large proportion will date from parturition. These hyperplastic or subinvoluted uteri were those which chiefly furnished Lisfranc's cases of "engorgement," which Jobert "melted down" with the actual cautery, and which hundreds to-day are treating by powerful caustics as parenchymatous metritis. The question may be asked, Do we ourselves not blister, apply leeches, and even amputate the cervix in these cases? The element which sustains the disease is an excessive supply of blood; to diminish this is to strike at the root of the evil. In areolar hyperplasia we blister lightly, to exert an alterative influence upon the nerves; for the relief of coincident congestion we leech occasionally, as we would for hyperæmia elsewhere; and we amputate, as we would do the enlarged tonsils; but nowhere would we treat the condition as inflammation.

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[1] *Op. cit.*, p. 89.

[2] *Op. cit.*, p. 372.

Compared with interference with involution, all other pathological influences become comparatively insignificant as causes of this condition; nevertheless, they must receive due weight. The tissue of the virgin uterus presents a structure unfavorable to this disorder. That of a uterus once affected by gestation offers a more propitious field for its development.

Displacement of the uterus at first results in passive congestion; this being kept up, hypergenesis of connective tissue takes place. Fibroids, whether they be submucous, subserous, or mural, keep up a constant nervous irritation that induces hyperæmia, which proves the first step toward this affection. In a very important essay Rouget[1] proves the uterus to be an erectile organ, as richly supplied with a network of vessels as such organs always are, and very subject to active physiological congestion. It is certain that such a kind of hyperæmia attends ovulation, and it is highly probable that sexual congress has a similar result. From this it will appear how prolongation of the *molimen menstruationis* and excessive indulgence in sexual intercourse, especially near menstrual epochs, may produce evil consequences.[2]

As cardiac diseases and abdominal tumors, which interfere with venous return through the vena cava, produce blood-stasis and œdema of the feet, of the labia majora, and of the parts about the vagina, so do they result in the same way in the uterus. Klob declares that this purely passive congestion is capable of inducing hypernutrition and hypertrophy of the connective tissue.[3]

It has been already said that in acute endometritis the hyperæmia attending the disease ordinarily extends to the parenchymatous layers immediately adjacent to the diseased mucous membrane, and that in chronic endometritis there is often in the submucous connective tissue an absolute hypertrophy. In some cases the process passes into a diffuse proliferation of the connective tissue of the entire uterine wall. Thus as a result of cervical endometritis we sometimes find cervical hyperplasia resulting, and so with the disease in the cavity of the body. As we have already stated, where the uterine parenchyma has never undergone the physiological hypertrophy and retrograde metamorphosis attendant upon utero-gestation, endometritis will continue for a long period without exciting hyperplasia; but where such changes have occurred the more loose and permeable texture offers itself as an easier prey to the morbid process. Thus cervical endometritis will continue for years in the virgin without any apparent enlargement of the structure of the neck, while such a result soon follows in a woman who has borne children. This fact formerly did not attract special attention, and yet it is a point which every practitioner must recognize when it is brought to his attention as one which is familiar. The reason for this difference is that during childbirth the cervix is very frequently torn or bruised, and in consequence cervical subinvolution, hyperplasia, and endometritis result. Parturition has been the predisposing cause, injury of the cervix the exciting.

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[1] Rouget, *Recherches sur les Organes érectiles de la Femme.*

[2] Scanzoni calls attention to the fact that it is met with in prostitutes.

[3] Klob, *op. cit.*, p. 130.

A very striking illustration of this affection due to non-puerperal causes is related by Dr. West, whose observation seems to have led him to very similar conclusions with mine. "Some years ago," says he, "I saw a lady, aged forty-three, who during thirteen years of married life had never been pregnant. She had always menstruated painfully and rather profusely, and both these ailments had by degrees grown worse, and this especially during the last few months. She complained of a sense of weight and dragging immediately on making any attempt to walk, and induced even by remaining long in the sitting posture. . . . Menstruation was very profuse, accompanied by discharge of coagula, while at uncertain intervals during its continuance most violent paroxysms of uterine pain came on. On examination the enlarged uterus was distinctly felt above the symphysis pubis, as large as the doubled fist, and *per vaginam* the whole organ was found much enlarged and much heavier than natural; the cervix large and thick, but not indurated; the os uteri small and circular; and the hymen was entire."[1] He goes on to say: "Whenever the uterus is exposed to unusual irritation it increases in size; not necessarily nor, I believe, generally as the result of inflammation, but because the organ is composed of formative material which excitement of any kind will call into active development."

In the first stage of the disease the hypertrophied areolar tissue is congested, containing absolutely more blood than normal, and the whole of the affected part, neck, body, or entire uterus, is greatly increased in size and weight. As time passes the second stage of the disorder supervenes, and an opposite state of things is set up. Klob describes it in these words: "The parenchyma on section appears white or of a whitish-red color, deficient in blood-vessels from compression of the capillaries by the contraction of the newly-formed connective tissue or from partial destruction or obliteration of vessels during the growth of tissue; the firmness of the uterine substance is also increased, simulating the hardness of cartilage, and creaking under the knife. This constitutes a true sclerosis[1] of the uterus.

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[1] [This case, with due deference to Dr. West and the author, would to me seem to illustrate far more probably and graphically the development of an interstitial fibroid in the uterus.—P. F. M.]

Every practitioner must have met with cases in which a large, red, engorged, and soft uterus, examined after an interval of several years, has been found, to his surprise, to have become small, densely hard, white, and anæmic, and its cavity diminished in size. Such an organ removed from the body cuts like fibrous tissue, and appears when cut almost as dense and bloodless.

In leaving this important and interesting part of my subject let us sum up in a few words what has been said:

1st. The condition ordinarily styled chronic metritis consists in an enlargement due to hypergenesis of its tissues, especially of its connective tissue, which induces nervous irritability and is accompanied by congestion.

2d. Decidedly the most frequent source of this state is interference with involution of the puerperal uterus. A very large proportion of the cases of so-called chronic parenchymatous metritis are really later stages of subinvolution.

3d. Areolar hyperplasia is often induced in a uterus which has once undergone the development of pregnancy, by displacement, endometritis, and other conditions inducing persistent hyperæmia.

4th. The same influences may possibly produce it in the nulliparous uterus; most frequently they do so in the neck, but such a result is exceedingly infrequent.

5th. However produced, the condition is one of vice of nutrition, engendering hyperplasia of connective tissue as its most striking feature, and, although attended by many of the signs and symptoms of inflammation, it in no way partakes of the character of that process.

It has been maintained by some that acute puerperal metritis extends itself into the chronic metritis of the non-puerperal state, and this form of the affection has been differentiated from subinvolution. We have seen no evidence of the correctness of this view, nor do we believe that any such distinction can be made at the bedside.

Course and Termination.—The length of time which this condition may last is very uncertain. After the connective tissue once becomes thoroughly affected by the disease it rarely returns to its original condition, but so complete is the relief which may be afforded the patient by removal of those concomitant conditions that attend upon it and increase the discomforts which are due to it, that she will often for years imagine herself well. Very suddenly, however, imprudence during menstruation, the act of parturition, over-exertion, or some other influence creating congestion will produce a relapse which will convince her of her error. It is astonishing to what an extent enlargement of the cervix as a result of areolar hyperplasia will go. Sometimes this part will equal in size a very small orange, and, filling the vagina, will compress the rectum to such an extent as to interfere with its functions. Uninterfered with by art, the disease has no fixed limits. The increase of uterine weight which it induces usually results in displacement. This increases already existing congestion, and the patient suffers, until the menopause at least, from endometritis, granular cervix, and the ordinary symptoms of displacement.

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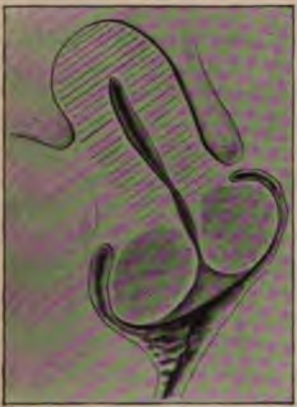
[1] The term "sclerosis" was, I believe, first applied to this condition by Skene of Brooklyn.

In some cases contraction of the exuberant tissue occurs, and uterine atrophy with its accompanying symptoms takes place.

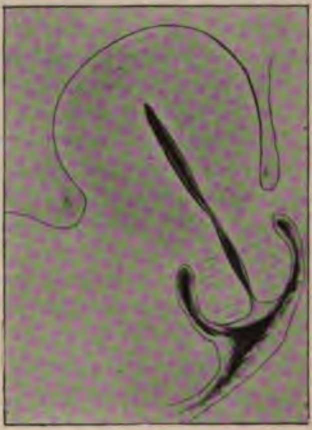
Varieties.—Whatever be its cause, areolar hyperplasia may affect the entire uterus; it may limit itself to the neck, extending from the os externum to the os internum, or it may affect the body from the os internum to the fundus. The habitat of hyperplasia limited to the cervix is represented by Fig. 146, while Fig. 147 represents that of the corporeal variety.

FIG. 146.



Cervical Hyperplasia (Diagrammatic).

FIG. 147.



Corporeal Hyperplasia (Diagrammatic).

Hyperplasia of the body of the uterus only is not at all common, either from imperfect involution or from non-puerperal causes. When it apparently does occur, the examiner should pay special attention to the possibility that it may be simulated by the development of intramural growths, usually of a fibrous or muscular character, or that malignant disease of the corpus uteri may be present.

When the cervix alone is hyperplastic the cause may generally be sought in the irritation produced by a lacerated cervix. This accident, as will be treated at length later on, is very common; hence cervical hyperplasia is by far more frequent than the corporeal variety. Occasionally the enlargement may be so marked that suspicion of its being due to malignant disease is well justified—a question which usually the microscope alone can definitely settle. The clinical history and special symptoms should, of course, be carefully weighed before deciding, since even the microscope may at times fail us.

Frequency.—This affection is one of great frequency, and as it was formerly universally regarded as chronic parenchymatous metritis, this is one great reason why inflammation of the structure of the uterus was thought to be so common. This fact makes its careful study a matter of great moment to the gynecologist. We do not hesitate to declare that he who fully masters it and thoroughly appreciates its frequency and influence will possess a key to the management of numerous cases which would in vain be sought for elsewhere.

As we have before remarked, interference with that retrograde metamorphosis of the puerperal uterus which is now styled involution is in the great majority of cases its cause. For this reason, as above remarked, the cervical variety is the most frequent. The reason for this is to be found in the facts that the cervix is peculiarly exposed to mechanical injury from coition, friction against the vaginal walls, and laceration occurring during parturient distension; that after child-bearing the connective tissue at this point is looser and more permeable than that of the body; and that when involution is retarded for some months, and then is accomplished, it usually takes place in the body, but fails to do so in the neck, from that exposure to injurious influences which has just been alluded to.

The body of the uterus is so completely removed from contact with mechanical agencies outside of the abdomen that this part of the organ, as already stated, is not so frequently affected by hyperplasia as the corresponding tissue of the cervix. Still, it is by no means unfrequently diseased. A large number of cases of obstinate uterine disorders occurring as a remote result of parturition are really of this nature, and the displacements, rebellious leucorrhœa, and other concomitant evils which characterize them are merely symptoms of this affection or of some of its resulting complications. An important fact connected with this state is that where hypertrophy of the connective tissue exists transient attacks of active congestion frequently occur and excite acute symptoms. These pass away, leaving the basis of the affection in its original state, again to return with all the signs of relapse. And thus a series of short but severe exacerbations go on developing themselves in the ordinary course of an attack of the disorder.

Predisposing Causes.—These may be enumerated as—

A depreciation of the vital forces from any cause;
Constitutional tendency to malnutrition or spanæmia;
Parturition, especially when repeated often and with short intervals;
Prolonged nervous depression;
A torpid condition of the intestines and liver.

Nulliparity secures, to a very great extent, an immunity from the disease, and multiparity constitutes a most important predisposing cause. This fact arises not merely from its being, as it often is, an immediate consequence of the parturient act, but from the peculiar tissue-changes of utero-gestation rendering the uterus prone to its development. "Frequently," says Klob, "this proliferation of connective tissue is developed after repeated deliveries in rapid succession without any previous or existing inflammation." . . . . Its "causes must be sought for in habitual hyperæmia;" consequently, whatever state gives a tendency to this must be regarded as a predisposing cause, while one which induces and perpetuates it must be looked upon as exciting. The woman who has never been pregnant is much less liable to areolar hyperplasia than she whose uterus has undergone the tissue-changes of utero-gestation. Nevertheless, in very rare and exceptional cases we think that she may suffer from it. In the whole of our experience we have seen but two or three cases, and the diagnosis in these is based upon clinical evidence alone.

Here let us guard the reader against a fallacious argument which is often used in reference to this matter. As areolar hyperplasia is rarely seen except in women who have borne children, it is said that it is always the result of interference with involution. This is incorrect. A woman bears a child, has no post-partum trouble, and goes through uterine involution perfectly. A year or two afterward she has endometritis. This in time produces areolar hyperplasia with its usual symptoms and physical signs. The same kind and degree of endometritis in a nulliparous woman would have lasted for years without parenchymatous complication. In the former case the endometric disease existed on ground favorable to hyperplasia, because an important predisposing cause existed. In the latter such predisposition was wanting.

The exciting causes are the following:

Over-exertion after delivery;
Puerperal pelvic inflammation;
Laceration of the cervix uteri;
Displacements;
Endometritis;
Neoplasms;
Cardiac disease;
Abdominal tumors pressing on the vena cava;
Excessive sexual intercourse.

After delivery many of both these sets of causes are developed by the pernicious system of management which nurses frequently adopt. The nerve- and blood-states of the woman are depreciated by starvation, impure air, and disturbance of sleep by attention to the wants of a child, while the enlarged uterus is forced into retroversion and the congestion which it induces by a very tight bandage, rendered still more hurtful by a thick compress over the uterus. The practitioner who regards delivery of the placenta as the end of the third stage of labor furnishes a marked predisposing cause. The third stage of labor consists in complete and permanent contraction of the uterus, and may not be accomplished for hours after the expulsion of the placenta. No obstetrician has done his duty who leaves his patient before its accomplishment.

Symptoms.—It is impossible to present the symptoms of this condition entirely separated from those of complications which very commonly attend it, such, for example, as displacement, laceration of the cervix, ovarian congestion, chronic endometritis, etc. These states of course produce symptoms of their own which mingle with those of the main disorder. Practically, they are identical with those produced by extensive laceration of the cervix and its complications. If the cervix alone be affected, they are—

Pain in back and loins;
Pressure on bladder or rectum;

Disordered menstruation;
Difficulty of locomotion;
Nervous disorder;
Pain on sexual intercourse;
Dyspepsia, headache, and languor;
Leucorrhœa.

If the affection be general or corporeal, the above symptoms are merely intensified in proportion to the increased size and weight of the uterus.[1] Chief among these are—

A dull, heavy, dragging pain through the pelvis, much increased by locomotion;
Pain on defecation and coition;
Dull pain, beginning several days before menstruation and lasting during that process;
Pain in the mammæ before and during menstruation;
Darkening of the areolæ of the breasts;
Nausea and vomiting;
Great nervous disturbance;
Pressure on the rectum, with tenesmus and hemorrhoids;
Pressure on the bladder, with vesical tenesmus;
Sterility.

Physical Signs of Cervical Hyperplasia.—Vaginal touch will generally discover that the uterus has descended in the pelvis, so that the cervix will rest upon its floor. The cervix will be found to be large, swollen, and painful, and the os may admit the tip of the finger. If the finger be placed under the cervix and it be lifted up, pain will usually be complained of, and if it be introduced into the rectum, so as to press upon the cervix as high as the os internum, it will often reveal a great degree of sensitiveness. Under these circumstances the direction of the uterine axis will generally be found to be abnormal. The cervix will in some cases have moved forward and the body backward, or the opposite change of place may have occurred.

Physical Signs of Corporeal Hyperplasia.—If two fingers be carried into the vagina and placed in front of the cervix, so as to lift the bladder and press against the uterus, while the tips of the fingers of the other hand be made to depress the abdominal walls, the body of the uterus will, unless the woman be very fat, be distinctly felt should the organ be anteflexed. Should it not be detected, let the two fingers in the vagina be now carried behind the cervix into the fornix vaginæ, and the effort repeated; if the uterus be retroflexed or retroverted, or even in its normal place, it will be detected at once. By these means we may not only learn the size and shape of the organ, but its degree of sensitiveness. This may likewise be accomplished to a certain extent by rectal touch. The uterine probe may then be introduced, the cavity measured, and the sensitiveness of the walls carefully ascertained.

A point which should be settled before the diagnosis can be considered complete will be whether the cervix alone is affected or whether its enlargement is only a part of a general uterine development. To determine this question two means are at command: first, the examiner, introducing one or two fingers under the body of the uterus, and depressing the abdominal walls by the other hand, so as to clasp the fundus, ascertains whether it is larger than it should be or of normal size and free from sensitiveness. He then passes the uterine probe into the cavity of the body and measures it. If the uterine cavity be increased in size, the evidence is in favor of the disease having extended to the tissue of the body. Should its size be normal, this is probably not the case. Still, in a large proportion of cases of general hyperplasia the length of the uterus is not increased, and the sound enters only the normal two and a half inches; but on bimanual palpation the body is felt to be decidedly thickened in the antero-posterior diameter.

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[1] It must not be supposed that all these symptoms occur in all or even in the majority of cases. In many cases few, and in some almost none of them, will be recognised.

Differentiation.—When the whole uterus is affected or the body of the organ alone is enlarged, the diseases with which areolar hyperplasia may be confounded in its first stage are—

Subinvolution;
Pregnancy;
Neoplasms.

From these a careful differentiation should be made, for if in error the practitioner would not only fail in giving relief, but in some cases might do great injury. For example, an examination by the probe might produce abortion and cause serious and alarming consequences. The introduction of the probe or sound should, for this reason, be practised with great caution, and only when good reason exists for supposing pregnancy absent.

Between pregnancy and endometritis with corporeal hyperplasia there is a chance of error in diagnosis, for in both there are enlargement of the breasts, darkening of the areolæ, enlargement of the uterus, derangement of the nervous system, and nausea and vomiting. In the one, however, menstruation does not cease, there is no kiesteine in the urine, there is great sensitiveness of the body of the uterus, and an abundant leucorrhœa.

Fibrous growths in the uterine walls will sometimes, from the peculiar symmetry of their development, completely mislead us, giving uterine enlargement, leucorrhœa of bloody character, etc. We have now in our possession a uterus in the anterior wall of which a fibrous tumor, equal in size to a goose's egg, gives upon superficial examination all the appearances of engorgement and hypertrophy of uterine tissue with anteflexion and endometritis. In the same manner polypoid growths or submucous fibroids might give trouble in diagnosis. Under such circumstances reliance would have to be placed upon the use of the sound, conjoined manipulation, and tents, together with the rational signs.

Sometimes, suspicion of scirrhous cancer in an early period being entertained, it becomes necessary to decide between its existence and that of the second stage of areolar hyperplasia or sclerosis. Scanzoni doubts the possibility of deciding, but it appears to me that the investigator will usually succeed in doing so by the following comparison of signs and symptoms:

In Cervical Sclerosis—	*In Scirrhous Cancer*—
The patient shows no cachexia.	She often does.
There is tendency to amenorrhœa.	There is tendency to hemorrhage.
The history usually points to parturition.	It does not.
It has been preceded by symptoms of uterine enlargement.	It has not.
The cervix feels like dense fibrous tissue.	It feels almost like cartilage.
The body is perhaps implicated.	It is rarely so.
A sponge-tent softens the tissue.[1]	It leaves it hard and dense.

Prognosis.—The prognosis in hyperplasia of the entire uterus or of the body alone is unfavorable with regard to complete cure, though highly favorable with reference to great relief of symptoms and to danger to life. Should the patient be approaching the menopause, it is possible that after the functions of the uterus cease atrophy may occur and relief be obtained. But one cannot be sure even of this, for the monthly discharge may give place to metrorrhagia or all the symptoms may continue in spite of the menstrual cessation. Under a course of local treatment, combined with one conducted with special reference to the general system, hope may always be held out that although restoration of the uterus to its normal condition may not be effected, the evils resulting from the complications of this disease can be so fully controlled that comfort will be obtained. When the neck of the uterus alone is affected, a favorable prognosis may always be made, for here there are fewer grave complications to be encountered, such, for example, as corporeal endometritis, menorrhagia, etc. The diseased part is likewise more accessible to local treatment, and is also a much less sensitive and important part of the organism; we might indeed almost say a less important organ, so distinct are the uterine body and neck physiologically and pathologically. As we have elsewhere stated, the prognosis will depend in a great degree upon the patient. If she be unwilling to sacrifice her inclinations and pleasures, but half fulfil the directions of the attending physician, and clandestinely expose herself to prejudicial influences, the treatment will accomplish nothing. In the case of a reasonable patient, who appreciates what is at stake and is anxious to regain her health, it may be regarded as favorable.

Complications.—Areolar hyperplasia may give rise to many and serious complications, as, for example, displacements, cystitis, rectitis, cellulitis, endometritis, menstrual disorders, hysteria, dyspepsia, ovarian disorders, etc.

Although it has been suggested that general areolar hyperplasia may have a causative influence on the production of uterine carcinoma, there is no valid reason to fear such a result, at least so far as the body of the organ is concerned. That a hyperplastic cervix, especially if the enlargement is due to laceration, may not eventually undergo malignant degeneration, we are not, however, prepared to deny.

Treatment.—Let us urge upon the practitioner, as a rule to be observed in every case before treatment is adopted for this disorder, to examine for and remove, if discovered, the four following complications, which very often accompany areolar hyperplasia and establish symptoms which greatly increase the evils attending it. So important do we consider them that we give them decided prominence:

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[1] This test originated with Spiegelberg.

1st. Laceration of the cervix uteri, which creates intense nervous irritation, both immediate and reflex, and consequent uterine congestion and neuralgia;

2d. Displacement of the uterus, which results in vascular engorgement, dragging upon uterine ligaments, mechanical interference with surrounding parts, and difficulty in locomotion;

3d. Fungoid degeneration of the endometrium, which results in profuse leucorrhœal and bloody discharges;

4th. Granular and cystic degeneration of the cervix, which produces nervous and vascular derangement of the uterus, leucorrhœa, and menorrhagia, and is generally due to laceration, or, if in the nullipara, to chronic endometritis.

He will be most successful in the treatment of areolar hyperplasia who most assiduously searches for and cures these complicating conditions before addressing remedies to the main affection.

Laceration of the cervix and exposure of the delicate walls of the cervical canal to friction against the vagina are so frequently not only a concomitant circumstance, but, we think, a cause of this condition by interfering with involution, that they should always be looked for. Let it not be supposed that a mere visual inspection will reveal their existence. It will often fail to do so, while the red and excoriated cervical walls are being for long periods treated for so-called ulceration by caustics and alteratives. To test the question, a tenaculum should be fixed in each labium cervicis, and the lips should be approximated so as to present to the eyes of the examiner the perfect cervix as it existed before the accident. Once discovered, the inner surfaces of the torn lips should be thoroughly pared and brought together by suture. Such an operation will often have a most happy effect upon the uterine disorder; nervous irritability will disappear and nutrition become greatly improved by removal of this focus of irritation.

If displacement exist, great benefit will be obtained from support rendered by means of a light and well-fitting pessary—the elastic ring of Meigs if there be merely direct descent; Hodge's double lever or one of its varieties if there be retroversion; or an anteversion pessary if the uterus have fallen forward. In some cases the benefit derived from these instruments will be the chief, perhaps the only, relief which we can bestow, and even where we cannot cure the disease we may by their use render life much more agreeable by the alleviation of discomfort.

If evidences of fungoid growths on the endometrium exist, the whole cavity should be gently scraped by the wire-loop curette, and this source of leucorrhœa, metrorrhagia, and uterine congestion taken away.

At the same time that we have elsewhere urged that too great importance should not be given to granular and cystic degeneration of the cervix, we would not ignore the fact that, once established, they become a source of irritation, and thus of uterine engorgement. They should by all means be treated and removed.

Vaginitis is secondary to uterine catarrh, which is a very common accompaniment of hyperplasia. It should be treated by the ordinary means elsewhere indicated, and a recurrence prevented by relief of the endometrial disease.

The subject carefully analyzed presents itself in this way: If the abnormal condition which has created areolar hyperplasia has passed away, this condition is not *in itself* the source of many disagreeable symptoms. No woman thus affected feels perfectly well, but she is often sufficiently comfortable to be able to perform all her duties in life. But the uterus thus diseased is peculiarly liable to certain complicating conditions which have just been mentioned, and these create a great deal of discomfort by production of pains in the back and loins, nervousness, leucorrhœa, and menstrual disorders. These symptoms are then in a great degree, as we stated in giving the symptomatology of hyperplasia, due to the complications of the disorder, and not to the disorder itself. In other words, sustain a hyperplastic uterus, keep it free from displacement, granular and cystic disease of the cervix, and uterine catarrh, and the patient will be so comfortable as in most instances to feel satisfied with her condition. Sometimes this is all that we can accomplish. The mere fact of accomplishing these results will, however, do much for the cure of the disease itself. Relief of displacement favors free venous return and prevents congestion, which feeds and perpetuates hyperplasia. Cure of uterine catarrh and of granular and cystic degeneration of the cervix removes two great causes for hyperæmia of mucous and submucous tissues. The means employed for the relief of these symptoms even do more: they tend by their own direct influence to alter the morbid state of the nerves of the part, to diminish the calibre of blood-vessels under their control, and thus to check excessive nutrition and secretion.

All complications being removed, the practitioner has now to deal with a large, heavy uterus, the tissue of which is exuberant, the blood-vessels enlarged, and the nerves in a condition of hyperæsthesia.

Let us enumerate the indications to be met by a few leading propositions:

1st. Everything possible should be done to prevent congestion, and remove that already existing;

2d. Every attention should be given to the restoration of the general system, especially the blood- and nerve-states;

3d. All weight should be taken from the large and heavy uterus;

4th. Nervous hyperæsthesia should be relieved by every means in our power.

The means for furthering these ends may thus be presented:

Rest;
General treatment;
Depletion;
Emollient vaginal injections;
Alteratives.

Rest.—The patient should be instructed to take much less exercise than usual, to lie upon her bed or lounge for an hour every day about mid-day, and to be especially quiet during menstrual periods. It is, as a general rule, highly improper to confine her to bed, for many women become restive under the confinement and suffer both in mind and body, the sanguineous and nervous systems being impaired by want of fresh air. If the connective tissue be so much affected that the cervix is very painful upon pressure, absolute rest upon the back may become necessary, but our impression is that deprivation of fresh air and exercise ordinarily does more harm than is compensated for by the advantages arising from quietude. Every day she should go, unless deterred by some special cause, into the open air, and a limited amount of exercise should be inculcated as a means of keeping up the general health.

Dr. Weir Mitchell has introduced a now well-tried and universally known plan for treating cases of neurasthenia, which consists of complete rest. The patient is for a period varying from six weeks to three months kept as quiet, upon her back in bed, as if she were a marble statue; or rather, we should say, as far as voluntary motion is concerned. She is fed by an attendant, who is constantly by her side, and is not allowed even to lift her arms from the bed. Meantime she is very thoroughly nourished by milk, animal broths, malt, cod-liver oil, eggs, and other nutritious substances every two or three hours, while cutaneous action is excited, peripheral circulation kept at a maximum of activity, metamorphosis and elimination are increased, and muscular strength is fostered, by manipulation, passive exercise, electricity, and kneading. The moral faculties are likewise supervised; hysterical symptoms are controlled by moral suasion, judicious neglect, and an earnest appeal to the reason of the patient; and the mind is made to feel the influence of alienation from home influences by entire seclusion from friends and relatives.

We can of course only allude to this plan, which observation leads us to set a very high estimate upon in the treatment of special cases, and would refer the reader for further details concerning it to the writings of Dr. Mitchell[1] and to an excellent article by Dr. William Goodell.[2]

The uterus should be placed at rest as much as possible. Its natural tendency under these circumstances is to fall from its position; consequently, all pressure should be removed from its fundus by wearing the clothing loose, sustaining the weight of the skirts by attaching them to the upper garments, so as to have the shoulders bear the burden, and uncompromisingly abolishing the corset.

At the same time a system of exercises should be practised by the patient calculated to develop the power of the abdominal and thoracic muscles, and thus restore or increase the retentive power of the abdomen. These will be alluded to in detail under the head of Displacements of the Uterus.

Abdominal bandages are very unpopular with many practitioners, who believe that they absolutely do harm. We believe otherwise, and regard them as great adjuvants, not in keeping up the uterus, but in supporting the superimposed viscera, which, pressed downward by tight clothing and badly supported on account of the relaxation of the abdominal walls, fall directly upon the fundus. There is a great variety of abdominal supporters. We have no favorite, for one will accomplish the end in a woman of a certain figure which would be inappropriate for another. That one should be selected which absolutely accomplishes the end in view—namely, sustaining the viscera and supplementing the weakened muscles of the abdomen.

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[1] *Fat and Blood, and How to Make them.*

[2] "Nerve-tire and Womb-ills," *Lessons in Gynecology.*

Sexual intercourse often produces bad results in an organ which is so prone to congestion, and great infrequency and caution should be enjoined with reference to it.

By combining all these means we do all in our power to place the hyperplastic uterus at rest, as we would a fractured bone or enlarged testicle.

General Treatment.—The diet should be plain and unstimulating, but at the same time nutritious and in every way calculated to maintain the normal state of the blood. Should spanæmia exist, ferruginous tonics, alone or combined with vegetable tonics, should be administered. The bowels should be kept in a perfectly normal state and the skin active. Specific remedies have been, and are still, employed by some practitioners for diminishing the size of the uterus. Of most of these we doubt the efficacy. During the state of enlargement—that is, before contraction of the exuberant tissue has occurred—ergot, kept up for a considerable time, produces good results. By its power of exciting contraction of the uterine tissue it diminishes hyperæmia and lessens the bulk of the uterus.

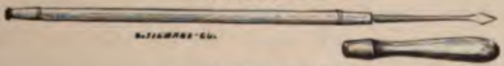
European writers speak in high terms of the alterative influences of the various watering-places and baths of the Continent, as those of Marienbad, Schwalbach, Brückenau, and Kissingen in Germany, and of Saint Sauveur, Barréges, etc. in France. None of these equal in reputation the waters of Kreuznach in Germany, the curative property of which depends to some extent upon the bromide of magnesium which they contain. It is very probable that the hygienic and social influences which surround these places and render them attractive are to be credited with most of the good that they do. The peat- or "moor"-baths, now so commonly used at Franzensbad, Kissingen, Schwalbach, and other German baths, undoubtedly have a very beneficial effect in reducing pelvic engorgement and allaying local and general neuroses.

No other general means compare in result with a change of abode and corresponding change of air, habits, and associations. A removal, for example, to the seaside, where bathing can be enjoyed, a sea-voyage, or a residence at an agreeable watering-place, may accomplish much good. Mental depression predisposes to and aggravates this disease most markedly. However this be, cheerful and congenial company certainly proves one of the best nervous tonics in a therapeutic point of view, and should always be sought for. A stay in a well-regulated hydropathic establishment, where the patient can have pure air, plain and nutritious food, and agreeable society, together with the strict attention to the general rules of hygiene which characterizes those institutions, will produce the best effects.

Depletion.—If vaginal touch and conjoined manipulation discover the fact that the uterus is tender, the occasional abstraction of small amounts of blood by puncture or scarification will be beneficial. Not more than an ounce or two should be taken at once, unless amenorrhœa be a symptom. In case this be so, a more copious abstraction by leeches during the menstrual epoch will often give great relief. At times leeches then applied to the cervix will give great pain by their bites. This is sometimes so severe as to lead to the apprehension that one has escaped into the cavity; hence it is important that they should be counted before being placed in the speculum and on their removal from it.

The two methods by which local depletion of the cervix can be best practised are leeching and scarification. Three or four large leeches, or a sufficient number of small ones to take from three to five ounces of blood, may be applied in the following manner: A cylindrical speculum, of sufficient size to contain the entire vaginal portion of the cervix, being passed and the part thoroughly cleansed, a small pledget of cotton, to which a thread has been attached for removal, should be placed within the os, so as to prevent the entrance of the leeches to the cavity above. A few slight punctures, sufficient to cause a flow of blood, should then be made in the cervix, and all the leeches to be employed thrown in, and the speculum filled at its extremity by a dossil of cotton pushed toward the bleeding surface. The speculum should be watched until they cease sucking, for if left for a very short time, even with the mouth of the instrument filled with cotton, they will escape. After their removal all clots of blood should be removed by a sponge or a rod wrapped with cotton, the speculum withdrawn, a large sponge squeezed out of warm water placed over the vulva, and the patient directed to remain perfectly quiet. Should scarification be employed, a very sharp and narrow bistoury or tenotomy-knife may be introduced within the os, and drawn outward toward the vaginal edges of the cervix, so as to sever all the superficial vessels over which it passes. We would recommend, in preference to this plan, acupuncture, which may be performed by an ordinary three-sided surgical needle held in the grasp of a pair of forceps, or, still better, by a little spear-shaped scarificator with three edges. This little instrument, when plunged about one-sixteenth of an inch into the cervix and given a rapid half turn before removal, causes a very free flow of blood should congestion exist. Cupping the cervix is no longer employed, being found unnecessary.

Fig. 148.



Spear-pointed Scarificator.

Dr. John Byrne of Brooklyn has drawn especial attention to still another method, which in some cases answers an excellent purpose. It consists in passing a long, delicate blade up the os internum, and cutting through the mucous membrane, its blood-vessels, and the superficial layer of muscular tissue as it is withdrawn through the os externum. Local depletion by one of these methods should be practised cautiously, the patient for twenty-four hours after its adoption being kept perfectly quiet in bed.

It is surprising to observe how steadily depletion by all these means has been during the last ten years going out of vogue in New York. Many gynecologists with large practices have entirely given it up, and in the Woman's Hospital it has almost completely passed out of use. It must be remembered, however, that the same statement would hold good in reference to abstraction of blood in every other department of medicine.

Still, we have seen great benefit follow the repeated scarification of the cervix in hyperplasia, especially to stimulate a scanty menstrual flow, and in chronic venous engorgement of the uterus, and leeching, while no longer as fashionable as it was, has done as excellent service in similar conditions. Let us warn, however, against allowing leech-bites to go unwatched during the first twelve to twenty-four hours, since very severe secondary hemorrhage may occur from them. It is better to insert a few tampons, covered with alum powder or soaked in pure vinegar, before leaving the patient, and to return within a few hours prepared to renew them if saturated with blood.

Vaginal Injections.—A great deal of advantage accrues in these cases from the systematic use of very copious vaginal injections of water as hot as the patient can bear them. They should be employed for from fifteen to twenty minutes at a time and once in every twelve hours. Their use quiets pain, improves the pelvic circulation, removes irritating secretions, and unquestionably stimulates the absorption of effused material.

Local Alteratives.—The best local alterative is the compound tincture of iodine, which by means of a brush of pig's bristles should be carried up to the os internum, or even to the fundus should endometritis exist, and over the whole cervix; then, waiting for complete drying, this process should be repeated. After these applications a wad of cotton, to which a string has been attached in such a way as to leave its surface flat, should be saturated with glycerin and laid against the cervix. This acts as a local hydragogue and disgorges the tissues. These local applications should be repeated two or three times a week, but others may be made daily by the patient herself by means of vaginal injections, by which the drugs just mentioned may be brought in contact with the cervix.

Should it appear to the practitioner that persistent hyperæmia requires more energetic means than those mentioned, resort may be had to counter-irritants which vesicate and destroy the mucous membrane of the vaginal cervix, and thus cause a free flow of serum. Such cases grow smaller and smaller in our practice as we grow older in experience, and although we admit the occasional necessity of these means, we caution the reader against a constant or too early resort to their use. They cannot diminish the absolute size of the enlarged organ, and should not be used with any such view. They can remove congestion and nervous exaltation, and in certain exceptional cases may be employed for these purposes.

Dr. August Martin of Berlin advocates amputation of one lip of the cervix for the induction of a species of involution in cases of areolar hyperplasia. Some time ago he reported 72 such operations, in only 7 of which did any inflammatory symptoms show themselves, and which were invariably followed by a diminution in the capacity of the uterus of from two to three centimetres. In a discussion which followed a paper by Martin, Kehrer, Schroeder, and Olshausen agreed with it. This method possesses none of the advantages of trachelorrhaphy, to which it is inferior in every respect, since it mutilates the cervix by entirely removing a portion of it, whereas trachelorrhaphy restores the part to its normal shape and condition. Both operations are usually employed where laceration of the cervix exists as a cause of the hyperplasia.

A wedge-shaped piece excised by knife or scissors from each lip, the acute angle of the wedge reaching to the vaginal vault, and the closure of the wound by wire sutures, as in trachelorrhaphy (we believe this operation was first advised by Simon of Heidelberg for this purpose), exerts a very beneficial influence in cervical hyperplasia by stimulating involution of the whole organ as well as of the cervix alone.

CHAPTER XXIII.

GRANULAR AND CYSTIC DEGENERATION OF THE CERVIX UTERI.

No subject in connection with gynecology has attracted more attention within the past fifty years than the so-called inflammatory "ulceration of the cervix uteri." Until a comparatively late period it was fully believed in, but as more careful observation has been practised the fact has been recognized that unless affected by direct pressure or friction from some solid body the cervix uteri is little prone to simple ulceration. It is, of course, everywhere admitted that cancerous and syphilitic ulcerations may affect this part, but no one would propose to style these inflammatory ulcers. It is likewise admitted that in a prolapsed uterus friction against a pessary or the clothing commonly produces true inflammatory ulceration. But these admissions do not touch the point at issue, and it is fully agreed to-day that the condition styled inflammatory ulceration by Dr. Henry Bennet and his school was not one of ulceration at all, but one of exuberant growth of the tissues of the cervix, with or without laceration of this part; which is much more correctly described under the names which head this chapter.

It not unfrequently happens that one symptom of a disease will so distress and harass a patient that remedial measures must be entirely directed to it, although the practitioner be aware of the fact that it depends on diseases elsewhere located. An example of this is frequently presented in the morbid state under consideration, which in itself proves so annoying by its profuse discharge and interference with the functions of the uterus and with locomotion as to call for prompt relief.

The vaginal surface of the cervix uteri is covered by a smooth mucous membrane which is continuous below with that of the vagina, and extending through the cervical canal joins that of the body, which differs widely from it, at the os internum. This membrane is covered by numerous papillæ which become visible when a sufficiently strong glass is used. One or more slender blood-vessels pass into each, and form at their extremities vascular loops, then return, and at their bases pass into adjoining ones. They are completely covered by pavement epithelium and basement membrane. Throughout the cervical canal mucous crypts or follicles exist, which are likewise found scattered over the vaginal portion of the cervix. The diseases of two of these elements of cervical mucous membrane are now to engage our attention.

Granular Degeneration of the Cervix.[1]

Definition.—This condition, which has been described under the names of erosion of the cervix, granular ulcer, and epithelial abrasion, consists, as its name implies, in the development of a surface of granular character on the smooth face of the cervix and just within the os.

Frequency.—It is an affection of great frequency, attending all the diseases of the uterus which result in leucorrhœa, and being commonly a concomitant of most of the diseased conditions of the parenchyma and lining membrane. It is, in fact, the most common consequence of chronic endometritis. Very often it exists for a length of time without any suspicion of its presence arising in the mind of patient or physician, and sometimes without causing symptoms which prove in any great degree annoying. Whatever grave constitutional symptoms exist with this condition are not directly caused by it, but rather by the primary disease of which it is only a result.

Causes.—The predisposing causes are—

Enfeebled general health;
Spanæmia;
The scrofulous diathesis.

Those which are exciting are the existence of—

Endometritis;
Laceration of cervix;
Displacements;
Areolar hyperplasia;
Abuse of sexual intercourse;
Pessaries which touch the vaginal face of the cervix.

The last two are merely accidental causes.

From this array of causes it will appear that it is rarely a disease which stands alone, but that it is usually engrafted upon some other affection of greater moment. Although this is true, it will not do in practice to carry this view too far. At the same time that it must be admitted that granular degeneration, even of aggravated character and considerable proportions, affecting the vaginal face of the cervix and the distal extremity of the cervical canal, is commonly a consequence of some pre-existing disease, the fact must not be lost sight of that this affection of itself keeps up a hyperæmia in the subjacent and neighboring parts of the uterus, and even extends a reflex influence to the ovaries.

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[1] [I have thought best to retain this section, although the condition here described is properly a symptom of chronic endometritis, and belongs in the chapter devoted to that disease. It was evidently the intention of the author to call special attention to this particular result of endometritis and to consider it a disease by itself, worthy of separate discussion. Appreciating the frequency and importance of this symptom, and the necessity for its recognition by the practitioner, I have decided not to change the author's plan. It should be distinctly understood that by the term "granular degeneration" of the cervix uteri is meant merely a raw, rough, irregular, freely-discharging or bleeding surface, all of which is due to abrasion of the epithelium and slight hypertrophy of the papillæ.—P. F. M.]

In general terms we may say that it is usually produced by—first, any disorder which keeps the mucous membrane of the cervix constantly bathed with ichorous fluids for a length of time; second, by anything which keeps up friction against the cervix; third, by any influence producing and perpetuating congestion of the uterus. Let the reader turn to the list of predisposing causes, and he will see that they are just such as to favor these morbid influences, and that the exciting ones are those which absolutely produce them. For example, displacements keep up congestion of parenchyma and mucous membrane, and produce uterine leucorrhœa and cause friction between the cervix, thus engorged and excoriated, and the vaginal surface. Hyperplasia produces displacement with all its results, furnishing in advance a tissue peculiarly prone to hyperæmia and already abnormal in character. Laceration of the cervix is a fruitful source of cervical hyperplasia, and the eversion of mucous membrane which attends it establishes friction which results in leucorrhœa and increase of hyperæmia. But it is unnecessary to apply remarks which are so obvious to each of the causes mentioned.

Before Emmet pointed out the pathological bearing of laceration of the cervix a great many cases of that accident were regarded as granular degeneration. A careful differentiation must be practised with reference to the two affections, while at the same time a proper degree of weight should be given to the fact that granular degeneration often occurs in virgins and involves the whole vaginal face of the cervix.

Symptoms.—Should granular degeneration exist with but trivial disorders of the uterus of any other kind very few symptoms may be present. Indeed, profuse leucorrhœa is sometimes the only one of which the patient will complain. The fact that other and more serious symptoms generally show themselves is a corroboration of the statement that graver disease of the uterus constitutes an important element in such cases. Ordinarily, these are the symptoms which will be noticed in a case of the more serious kind:

Profuse bloody and purulent leucorrhœa;
Pain and hemorrhage after intercourse;
Menorrhagia or metrorrhagia;
Pain on locomotion;
Bearing-down sensations;
Fixed pain in back and loins;
Tendency to spanæmia;
Nervous disorders and perhaps hysteria.

Physical Signs.—Vaginal touch alone might serve as a diagnostic **means**, for by it the cervix is felt to be covered by a velvety or granular **surface**, which, to the practised finger, is at once recognizable. But the speculum offers the fullest corroboration or corrects any error committed by this means. By it the cervix, more especially near the os, is seen to be covered by a mass of muco-pus, which being removed lays bare an intensely red, granular, hemorrhagic-looking space of greater or less extent, closely resembling the inner surface of the eyelids when affected by granular degeneration. The diseased surface does not appear depressed below, but is sometimes even elevated above the surrounding mucous membrane.

Course and Duration.—The disease is unlimited. If the general health improve, it is possible that nature may effect a cure without the aid of local treatment, but such a result should not be anticipated. The degenerated surface may go on for an unlimited time pouring out pus, and thus in predisposed subjects greatly impoverish the blood and cause grave constitutional results.

Pathology.—According to Ruge and Veit, the maceration of the cervical mucous membrane in ichorous fluids results in the desquamation of epithelium to such an extent that only one layer of cells exists, through the diaphanous structure of which the red-colored tissue beneath is visible with its exaggerated vascular supply.

Very soon from the epithelial layer prolongations project inward, dividing the subjacent tissue into villi or processes, such as are formed in the vesical and uterine mucous membrane. These villous projections are new formations, not hypertrophied papillæ. They are covered with epithelium, richly supplied with superficial blood-vessels, and liable to increase to large masses. To these in former times the now obsolete names of "bleeding ulcer" and "cock's-comb granulation" have been given.

Prognosis.—The prognosis in this affection is always good, though it may require a great deal of time to effect a cure, for this will not be permanent unless that of the coexisting disease be accomplished.

Treatment.—Before treatment for this condition is commenced let us urge the practitioner to examine carefully as to whether he is really dealing with a case of granular degeneration or with one of cervical laceration. The two conditions closely resemble each other; the former often complicates the latter, and a treatment which is appropriate to the one is utterly insufficient for the other.

Granular degeneration being generally a secondary disorder engrafted upon a pre-existing one, before treatment is adopted the primary disease should be sought for, and both should be treated simultaneously.

Having presented these remarks and sufficiently insisted upon their importance, we now proceed to the consideration of the special treatment of the condition itself. Before commencing treatment the general health should receive especial attention, those tonics and hygienic directions which appear best suited to the particular case being given. These indications should from the commencement be as far as possible fulfilled: first, the granular surface should be put beyond the influence of friction; second, it should be protected from contact with ichorous discharges; third, a steady alterative influence should be exerted upon it by local applications; and fourth, congestion of the uterus and of the especial part diseased should be prevented.

To accomplish the first indication the uterus, if displaced, should be put and kept in position by a well-fitting pessary. Even if its axis be normal, it is often excellent practice to lift it out of the pelvis by an elastic ring. At the same time such support prevents a tendency to congestion of the organ, and may be rendered more effectual by careful removal of all weight from the abdomen by tightly-fitting or heavy clothing. Let no one who has not tried this as an adjuvant undervalue it, for there can be no question of its great utility.

In fact, practically the same treatment should be employed as has been recommended for chronic endometritis. Among those remedies which the patient can employ herself stands foremost the persevering use of copious hot vaginal injections, or "douches," as they are now generally called, taken in the dorsal recumbent posture, from an irrigator or fountain syringe, twice daily, at a temperature of 115° to 120° F., for ten or fifteen minutes.

The best topical application to the diseased surface is the sharp steel curette, followed by the immediate use of strong nitric or chromic acid, and, when the slough has separated, by dry tannin or iodoform powder, either separate or, as we prefer, mixed in equal parts, and retained in position by a dry cotton or wool tampon. These last applications must be repeated every other day until the wound is healed. Exuberant granulations can be removed with the sharp curette or scissors, and then treated as above.

Should simple eversion of the cervix exist, the hemorrhoidal mucous membrane should be at once removed by the scissors or destroyed by fuming nitric acid. When this is excessive and due to laceration of the canal by parturition, the condition may be cured by an operation which consists in paring with long scissors the edges of the cervical fissure and passing deep sutures of silver wire so as to approximate them thoroughly. By this means the os is restored to its integrity, and the everted mucous surfaces being placed face to face, friction against them is prevented.

The last indication in enumeration, but not in importance, is the prevention of congestion, local and general. To a certain extent this is accomplished, locally, by all the alterative and astringent applications alluded to, and the same thing may be furthered by vaginal suppositories and injections. Should any case prove very obstinate, this end may be more decidedly attained by taking a sharp-pointed, curved bistoury and beginning as high up the cervix as the disease extends, cutting through the mucous membrane and submucous tissue, extending the incision outside the os as far as the surface is affected. Five or six such superficial and painless incisions sever the network of little vessels in the submucous tissue, and, for the time at least, interfere with the circulation.

Congestion of the whole uterus is greatly relieved by removal of weight from it by abdominal and skirt supporters; avoidance of muscular efforts; the use of a pessary; careful regulation of the bowels; rest, especially during menstruation; and the use of copious hot vaginal injections.

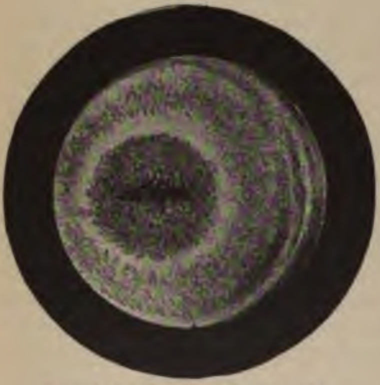
Applications should be made not only by the physician, who will probably use the speculum not oftener than once a week, but also by the patient, who should make them daily by injections and suppositories. The former should be thus employed: every night and morning a gallon of hot water, containing one ounce of glycerin and one drachm of sulphate of zinc, or two of sulphate of alum, acetate of lead, or tannin, should be injected for a period varying from ten to twenty minutes. Or if it be found necessary to employ a stronger astringent solution, a gallon of pure water may be used first for the time mentioned, and then a medicated solution, one quart in amount, be used for a short time afterward.

Vaginal suppositories, containing one or the other of the above substances in greater proportion than could be administered in solution by injections, have fallen into disuse for diseases of the cervix. They are now used chiefly for obstinate leucorrhœa in virgins, where the hymen prohibits the usual treatment through the speculum.

Cystic or Follicular Degeneration of the Cervix.[1]

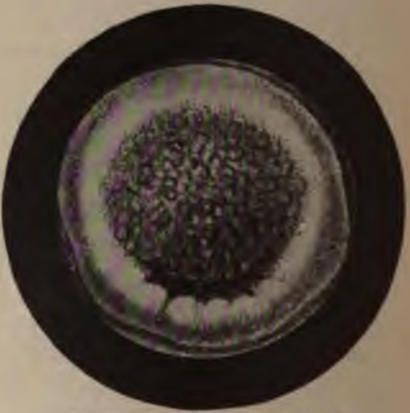
Definition.—This form of disease, though not so frequent as that last mentioned, is by no means rare. It consists in an inflammation of mucous follicles, which resemble those of the cervical canal, and which are scattered over the vaginal face of the cervix and exist even in the cavity of the womb. "The cervical mucous cysts," says Farre, "are lined by epithelium and basement-membrane. They contain a small quantity of mucus, together with granule-cells. Those upon or near the margin of the os uteri may be sometimes observed to contain

FIG. 149.



Catarrhal Erosion of Cervix (after L. Heitzmann).

FIG. 150.



Papillary Erosion of Cervix (after L. Heitzmann).

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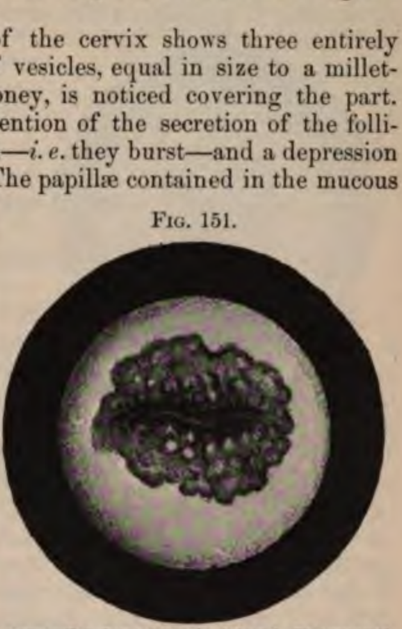
[1] [As "granular degeneration" of the cervix is a result of chronic endometritis, so may cystic and follicular degeneration follow the same disease. But, in addition, the latter conditions are very commonly found in cervices which have undergone parturient laceration, and are among the usual results of that lesion. I have retained this section, instead of incorporating it in the chapter on Laceration of the Cervix, for the reason already given.—P. F. M.]

short papillæ within their margin." A recollection of these facts is essential to a full understanding of the stages of this form of degeneration.

Pathology.—Follicular disease of the cervix shows three entirely different phases: 1st. A number of vesicles, equal in size to a millet-seed and filled with a fluid like honey, is noticed covering the part. These are due to repletion from retention of the secretion of the follicles. 2d. These cysts are seen open—*i. e.* they burst—and a depression marks the former site of each. 3d. The papillæ contained in the mucous membrane undergo hypertrophy, and cause the appearance of red, elevated, hemorrhagic-looking tubercles in place of the depressions just mentioned. Usually the cervix is soon studded over by little globular bodies about as large as a hemp-seed, with here and there a depression, and here and there a prominence of red and irritable-looking character.

FIG. 151.



Cystic Erosion of Cervix (after L. Heitzmann).

Synonyms.—It will now be appreciated why a variety of names should have been applied to this disease when examined at different stages. Follicular disease is supposed to be the source of the eruptive affections described by authors as acne, herpes, and aphthæ of the uterus—terms which are now obsolete, and are replaced by that used by us, or, if the degeneration is excessive and simulates an actual neoplasm, by the words "cystic hyperplasia."

Causes.—Anything which keeps up congestion in the cervical mucous membrane may give rise to this affection of the mucous glands of the vaginal cervix. Among the chief are—

Cervical endometritis;
Cervical hyperplasia;
Laceration of the cervix.

Prognosis.—If a few scattered cysts appear, the prognosis is decidedly favorable; but in certain rare cases, where the whole of the extremity of the cervix is filled by them, nothing but excision of the diseased tissue, or even amputation of the part containing them, accomplishes cure.

Treatment.—The contents of all the cysts should be evacuated by a bistoury, and their cavities thoroughly cauterized by a sharp point of nitrate of silver, chromic acid, or nitric acid. Should the second or third stage exist, the diseased surface should be treated upon very much the same plan as that advised for granular degeneration.

Should a great amount of cystic degeneration exist, and cure not follow evacuation and cauterization of the cysts, the diseased portion of the vaginal face of the cervix should be removed by bistoury or scissors, and, if feasible, the edges of the wound drawn together by catgut or wire sutures. Here, as in cervical endometritis of cystic character, the rule of surgery which inculcates the ablation of a part which is the habitat of a disease which proves incurable by minor means should be followed.

CHAPTER XXIV.

SYPHILITIC ULCER OF THE CERVIX UTERI.

Frequency.—Syphilis may affect the cervix uteri either as a primary or secondary disorder, though in neither form is it by any means common. It is now a settled fact that true chancre may locate itself upon the cervix, but not the less certain is it that it rarely does so. We have seen but one case which we felt satisfied was of this character. This was proved by inoculation, the most certain way in which a strictly reliable conclusion can be arrived at, and by corroborative evidence existing in the presence of syphilitic roseola without primary disease elsewhere. M. Bernutz, who has made, according to Becquerel,[1] a special study of this subject in the hospitals of Paris, describes chancres of the os minutely, dividing them into Hunterian, diphtheritic, and ulcerous, which resemble phagedenic very closely. With regard to secondary affections on the cervix, there has been considerable discussion, some regarding them as quite common, others as very rare. Becquerel, after careful research in L'Ourcine Hospital at Paris, was convinced of their occurrence, and Bernutz describes mucous patches, vegetations, erosions, tubercles, and gummy tumors. We know of no more significant evidence of the rarity of these affections upon the cervix than the fact that in a recent work upon syphilis—a work remarkable for the thorough and comprehensive style with which it deals with all relating to that subject—almost no mention is made of syphilitic affections of the cervix. We allude to the work of the late Professor Bumstead.[2] The author investigates the character of syphilis when affecting all parts of the body, even the lachrymal sacs, the membrana tympani, etc., but nowhere is any mention made of the disease appearing on the cervix, except a cursory statement that at Bellevue Hospital he had seen some remarkable instances of mucous patches thus located. The sign of the secondary disorder which we would most naturally expect to find in this site would be the mucous patch, as it is one of the most frequent of all the manifestations of that stage; but we are informed by MM. Davasse and Deville[3] that of one hundred and eighty-six women affected by syphilis and examined in reference to the location of its lesions, they were found on the cervix uteri but once.

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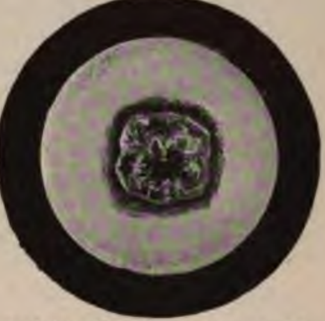
[1] *Mal. de l'Utérus*, vol. i. p. 169.

[2] Bumstead on *Venereal Diseases.*

[3] Davasse and Deville, "Des Plaques muqueuses," *Arch. gén. de Méd.*, 1845, t. ix. et x.

The gynecologist, in our experience, has but few opportunities to see this disease, because his practice is more likely to be among the more respectable classes of females, who are not often exposed to venereal infection; and even the practitioner whose clientèle is composed largely of prostitutes will not recognize syphilitic ulcer of the cervix frequently, since it can only be discovered by the speculum, and this may not be called for until long after the damage is done, the disease transmitted, and its nature revealed by secondary manifestations. [I have seen but one case of true chancre of the cervix before the appearance of roseola or later secondary symptoms. This patient, a "femme entretenue," was sent me by the gentleman interested, because he suspected from certain appearances on his glans penis that something might be wrong. A specular examination showed a yellow, slightly depressed, circular ulceration of the external os. The diagnosis of true chancre was confirmed two weeks later by a distinct roseola, and the patient's male friend eventually went through a severe experience with the constitutional symptoms.—P. F. M.] We would refer the reader to Bumstead & Taylor's work, or to other modern works on venereal disease, for a full description of this form of that disease.

FIG. 152.



Syphilitic Ulcer (hard chancre) of Cervix (after L. Heitzmann).

Course and Termination.—The primary affection being located on the cervix, the general system becomes affected as from a chancre on any other part, and, as M. Gosselin has pointed out, instead of passing off rapidly, as it sometimes does, it may assume the fungous type. During its course the cervical chancre has a marked tendency to become covered by false membrane, which Robert[1] first noted and Bernutz subsequently corroborated. Unless a fact corroborated by Förster[2] be carefully borne in mind by the diagnostician, a grievous error may occur in the differentiation of this form of ulcer from malignant disease. He declares that syphilitic ulcers sometimes destroy tissue so freely as to penetrate into the bladder or rectum.

Differentiation.—For evident reasons, this is a matter of great importance, not only as regards therapeutics, but because it may involve a delicate legal question affecting the chastity of the woman.

These are the means of diagnosis in cases of chancre:

Border of ulcer precipitous;
Surface of ulcer depressed;
Yellow, opaque color;
Rapid development of constitutional symptoms;
Early appearance of roseola;
Transmission by inoculation.

All of these signs are of value, but the only ones upon which a positive opinion could be based are the last three.

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[1] Aran, *Mal. de l'Utérus*, p. 524.

[2] Klob, *op. cit.*, p. 243.

Secondary eruptions—as, for example, mucous patches, vegetations, etc.—which appear here will be known by—

Their rapid development;
Their connection with constitutional signs;
Simultaneous affection of the vagina;
Absence of chronic cervical inflammation;
The peculiar appearance of secondary eruptions.

Treatment.—This will consist in cases of chancre of the ordinary treatment adopted when such an ulcer affects any other part. In cases of secondary affections the patient should be put upon a mercurial course, the surface cauterized, and subsequent dressings made of mercurial preparations, of which the black or yellow wash, mercurial ointment, and calomel are the best.

CHAPTER XXV.

UTERINE FUNGOSITIES.

History.—The fact that the lining membrane of the uterus becomes covered to a greater or less degree with fungous masses which have a marked tendency to bleed was announced by Récamier, who not only described them, but gave us the best method yet devised for their relief. After attention was called to the subject by him, theses were written upon it in Paris and Strassburg by Rouyer and Goldschmidt, and the subject attracted a great deal of notice in France, and received the attention of such men as Marjolin, Robert, Trousseau, Nélaton, Maisonneuve, and Nonat, who not only adopted Récamier's pathological views, but endorsed and practised his method of treatment. After many years of trial this contribution of the great French gynecologist may be regarded as by no means the least valuable of the many which he has made to this department. For a long time kept ***sub judice***, it has of late years found its way into the textbooks.

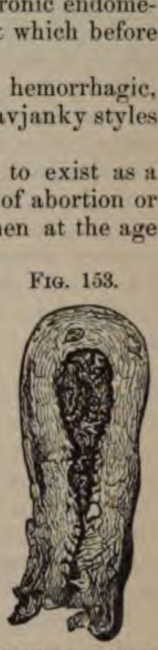
Definition.—Uterine fungosities may be defined as fungous projections from the endometrium, the result of prolonged congestion from any cause or of the organization of portions of placenta remaining attached to the surface. Under this head, of course, carcinoma and sarcoma of the endometrium might, through an error in diagnosis, be brought, but the nature of those grave disorders being once recognized, no one would think of classifying them under it. Upon theoretical grounds objection might be raised to classifying under the same head hyperplasia of the lining membrane of the uterus and remains of the placenta, but as the symptoms and treatment of the two conditions are identical, and there is no means of differentiating one from the other, it seems better for practical purposes to consider them together.

Frequency.—Fungoid degeneration of the endometrium is an affection of great frequency—one which plays the part of an important factor in metrorrhagia and menorrhagia, and which often saps the health of patients in whom its existence remains for years unsuspected. The practitioner who recognizes the important bearing of this subject will find himself prepared to cope with many cases of chronic endometritis, menorrhagia, metrorrhagia, and uterine enlargement which before proved entirely rebellious to treatment.

Synonyms.—The disorder is sometimes described as hemorrhagic, granular, hyperplastic, or polypoid endometritis, or, as Slavjanky styles it, "internal villous metritis."

Pathology.—Uterine fungosities will usually be found to exist as a consequence of uterine engorgement, however kept up, or of abortion or labor. We have also repeatedly seen them in young women at the age when menstruation is establishing itself, and found them under those circumstances produce a most excessive and dangerous degree of hemorrhage. In the first condition mentioned prolonged congestion creates a hypergenesis of tissue which results in hyperplastic growths upon the endometrium. In the second, if a large portion of placenta remained attached *in utero*, what is sometimes styled a placental polypus would be created, but small portions only being here and there attached, these little fungosities are the result. In the third condition the great impetus given by puberty to sexual growth in the developing girl seems to affect the uterine lining so as produce localized hypertrophies upon its surface.

FIG. 153.



Multiple Adenoma, or so-called Uterine Fungosities (Winckel).

Under the microscope these growths, if the result of hyperplasia and not of retention of small portions of placenta, are found to consist, according to Dr. F. Delafield, who has repeatedly examined them for us, of hypertrophied elements of the mucous membrane, dilated follicles, enlarged blood-vessels, and exaggerated cell-growth. Sometimes the amount of material removed at one time will amount to one, two, or three drachms, and its appearance will make one instinctively dread the existence of a malignant basis; but the microscope will commonly, even in such cases, convey the comforting assurance to the contrary.

It should again be mentioned, however, that the true intra-uterine fungosities in no way depend upon, or are connected with, the pre-existence of conception or the retention of placental villosities. The fungosities occur entirely independently as the result of chronic uterine congestion and hyperplasia, and have been grouped by German authors under the generic heading of *adenoma*, or glandular neoplasms.

Causes.—The causes may be enumerated as follows:

Abortion, or labor at full term;
Endometritis;
Subinvolution;
Laceration of the cervix;
Uterine displacement of any variety;
Fibromata, submucous or interstitial.

All these, except the first, seem to produce the condition by exaggerating formative development or by keeping up engorgement of the uterine lining membrane.

Symptoms.—There is but one symptom which has any significance; that is uterine hemorrhage. This may consist only in a great exaggeration of the menstrual flow or in profuse metrorrhagia. Whenever either or both of these is present without other assignable cause, these growths should be suspected. For example, a patient has lost a great deal of blood from the uterus, and an abnormal condition is strongly suspected as the cause of the excessive flow; no laceration of the cervix is found to exist, or at least none which could account for the hemorrhage, no neoplasm of any kind is discovered, and no large portion of placenta is supposed to be *in utero;* under these circumstances fungosities should always be suspected and their existence determined by physical examination. The method of deciding the question is so simple that it should, under these circumstances, be unhesitatingly employed.

Physical Signs.—Fungosities being suspected to exist, the patient should be examined with Sims's speculum. After its introduction the cervix should be held by the tenaculum, and, if the os externum or cervical canal be very small, it should be gently stretched with a steel two- or three-branched dilator (Ellinger's or one of its modifications or Sims's) until it will admit the little wire curette to be shown farther on in this chapter. An ordinary looped wire answers very well, and we have even made a loop of a lady's hairpin, bound it with waxed thread in the bite of the forceps, and employed that.

All being now prepared, the loop of the wire curette is passed in and drawn gently down the anterior face of the uterine cavity, then of the posterior, and then of each horn. As it is withdrawn after making each exploration, it is examined to see if it has dislodged a fungosity. If there be any within the cavity and the instrument be not held in very unskilful hands, one or more will be looped off. These may, for greater certainty of diagnosis, be put under the microscope. In some cases a mammilloid process of mucous membrane will be found covered with epithelium placed edgewise upon it with great regularity; in others a piece of placenta will be seen; while in a few cases the tale will be told of commencing cancer or sarcoma, which will yield to no treatment whatever, except the extirpation of the whole uterus.

It has been said that the curette gently passed over the endometrial surface will reveal little irregularities, even if it do not remove them; and in very marked cases this is true, but he who relies upon this as a crucial test will pass over many minor cases requiring diagnosis an treatment scarcely less than they. The wire loop should be regarde as a valuable diagnostic resource in all endometrial outgrowth Employed as such as freely as we make use of it, we have yet to see a accident follow its introduction if applied with caution.[1] We have see the uterine sound excite peritonitis, but never the wire loop used gently for the purpose merely of diagnosis. By its instrumentality the powerful aid of the microscope is put at our service, and many an obscure case will be made clear, many a doubtful one set at rest by the combination.

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[1] I have recently seen a perforation of an unusually soft fundus uteri take pl with the flat sharp curette in my own hands in a case where I was curetting the uteri cavity for hemorrhage following a probable early absorption. No force had been u but the curette suddenly slipped through the right horn of the fundus. The cav

Course, Duration, and Termination.—These growths may last, producing their evil results, for years—not increasing at all, but not diminishing. If the patient become pregnant, the changes of parturition seem in some cases to destroy their activity, but even this they at times resist, and after delivery the case goes on as before.

Sometimes the little growths will be cast off and appear in the menstrual discharge. But this casting out does not go on to cure. If not interfered with, they will commonly annoy and weaken the patient until the menopause, when, notwithstanding their presence, the uterine flow will usually cease. We say "usually," for the reason that in some cases it will obstinately continue at irregular intervals for years after its occurrence.

The remedy to which we have made allusion as having been introduced by Récamier is the use of the curette, which meets the requirements of the condition perfectly. It must not, however, be supposed that one or even several applications of the curette will uniformly cure these cases; many of them will prove very obstinate, rebellious, and perplexing. [Some years ago I attended, with Dr. Fessenden of Brooklyn, a young lady of sixteen who, ever since the establishment of menstruation, had lost blood so freely at her periods as to be alarmingly exsanguinated. I employed the wire curette and removed a great number of large growths, and she got up apparently well. In three months, however, her dangerous symptoms returned, and the operation was repeated, and followed by injection of compound tincture of iodine into the uterine cavity. Again she got better, and again had a relapse after a few months. Sims's cutting currette was then employed, and after its use nitric acid was applied by Lombe Athill's method. After this Dr. Fessenden occasionally made an application of iodine to the uterine cavity, and she ultimately recovered.

In another case which I attended with Dr. L. M. Yale of New York the curette was, during the course of three years, used ten times, very large quantities of fungous growths being each time removed, and the application of the instrument, Sims's being sometimes employed, and at other times mine, followed by free applications of iodine or nitric acid. After a time we felt sure that sarcoma or cancer must be the basis of the affection, but Dr. Delafield cheered us with the assurance that this was not so, and the justice of his statements was verified by the entire recovery of our patient. In a great many cases I have had to repeat the operation of scraping about once a year for a long time, so that now I always guard my patients against this possibility for fear of their being disappointed at the result.—T. G. T.]

of the uterus was at once swabbed with tincture of iodine to excite its contraction, loosely packed with iodoform gauze, an ice-bag applied, and the patient put to bed. She made a smooth recovery.—P. F. M.

speculum offers the fullest corroboration or corrects any error committed by this means. By it the cervix, more especially near the os, is seen to be covered by a mass of muco-pus, which being removed lays bare an intensely red, granular, hemorrhagic-looking space of greater or less extent, closely resembling the inner surface of the eyelids when affected by granular degeneration. The diseased surface does not appear depressed below, but is sometimes even elevated above the surrounding mucous membrane.

Course and Duration.—The disease is unlimited. If the general health improve, it is possible that nature may effect a cure without the aid of local treatment, but such a result should not be anticipated. The degenerated surface may go on for an unlimited time pouring out pus, and thus in predisposed subjects greatly impoverish the blood and cause grave constitutional results.

Pathology.—According to Ruge and Veit, the maceration of the cervical mucous membrane in ichorous fluids results in the desquamation of epithelium to such an extent that only one layer of cells exists, through the diaphanous structure of which the red-colored tissue beneath is visible with its exaggerated vascular supply.

Very soon from the epithelial layer prolongations project inward, dividing the subjacent tissue into villi or processes, such as are formed in the vesical and uterine mucous membrane. These villous projections are new formations, not hypertrophied papillæ. They are covered with epithelium, richly supplied with superficial blood-vessels, and liable to increase to large masses. To these in former times the now obsolete names of "bleeding ulcer" and "cock's-comb granulation" have been given.

Prognosis.—The prognosis in this affection is always good, though it may require a great deal of time to effect a cure, for this will not be permanent unless that of the coexisting disease be accomplished.

Treatment.—Before treatment for this condition is commenced let us urge the practitioner to examine carefully as to whether he is really dealing with a case of granular degeneration or with one of cervical laceration. The two conditions closely resemble each other; the former often complicates the latter, and a treatment which is appropriate to the one is utterly insufficient for the other.

Granular degeneration being generally a secondary disorder engrafted upon a pre-existing one, before treatment is adopted the primary disease should be sought for, and both should be treated simultaneously.

Having presented these remarks and sufficiently insisted upon their importance, we now proceed to the consideration of the special treatment of the condition itself. Before commencing treatment the general health should receive especial attention, those tonics and hygienic directions which appear best suited to the particular case being given. These indications should from the commencement be as far as possible fulfilled: first, the granular surface should be put beyond the influence of friction; second, it should be protected from contact with ichorous discharges; third, a steady alterative influence should be exerted upon it by local applications; and fourth, congestion of the uterus and of the especial part diseased should be prevented.

To accomplish the first indication the uterus, if displaced, should be put and kept in position by a well-fitting pessary. Even if its axis be normal, it is often excellent practice to lift it out of the pelvis by an elastic ring. At the same time such support prevents a tendency to congestion of the organ, and may be rendered more effectual by careful removal of all weight from the abdomen by tightly-fitting or heavy clothing. Let no one who has not tried this as an adjuvant undervalue it, for there can be no question of its great utility.

In fact, practically the same treatment should be employed as has been recommended for chronic endometritis. Among those remedies which the patient can employ herself stands foremost the persevering use of copious hot vaginal injections, or "douches," as they are now generally called, taken in the dorsal recumbent posture, from an irrigator or fountain syringe, twice daily, at a temperature of 115° to 120° F., for ten or fifteen minutes.

The best topical application to the diseased surface is the sharp steel curette, followed by the immediate use of strong nitric or chromic acid, and, when the slough has separated, by dry tannin or iodoform powder, either separate or, as we prefer, mixed in equal parts, and retained in position by a dry cotton or wool tampon. These last applications must be repeated every other day until the wound is healed. Exuberant granulations can be removed with the sharp curette or scissors, and then treated as above.

Should simple eversion of the cervix exist, the hemorrhoidal mucous membrane should be at once removed by the scissors or destroyed by fuming nitric acid. When this is excessive and due to laceration of the canal by parturition, the condition may be cured by an operation which consists in paring with long scissors the edges of the cervical fissure and passing deep sutures of silver wire so as to approximate them thoroughly. By this means the os is restored to its integrity, and the everted mucous surfaces being placed face to face, friction against them is prevented.

The last indication in enumeration, but not in importance, is the prevention of congestion, local and general. To a certain extent this is accomplished, locally, by all the alterative and astringent applications alluded to, and the same thing may be furthered by vaginal suppositories and injections. Should any case prove very obstinate, this end may be more decidedly attained by taking a sharp-pointed, curved bistoury and beginning as high up the cervix as the disease extends, cutting through the mucous membrane and submucous tissue, extending the incision outside the os as far as the surface is affected. Five or six such superficial and painless incisions sever the network of little vessels in the submucous tissue, and, for the time at least, interfere with the circulation.

Congestion of the whole uterus is greatly relieved by removal of weight from it by abdominal and skirt supporters; avoidance of muscular efforts; the use of a pessary; careful regulation of the bowels; rest, especially during menstruation; and the use of copious hot vaginal injections.

Applications should be made not only by the physician, who will gauze after curetting, and often slip a thin strip of the same material into the uterine canal to facilitate drainage. The failure to tampon the vagina carefully may result in a sudden call during the ensuing night on account of a more or less severe hemorrhage, and the unpleasant necessity of tamponing then. As a guard against hemorrhage, and also to procure a more thorough result, we usually plug the uterine cavity with a cone of absorbent cotton saturated in compound tincture of iodine, which, with the vaginal tampons, is removed in forty-eight hours at the latest. Whether the tampons are then to be replaced by fresh ones depends on the case.

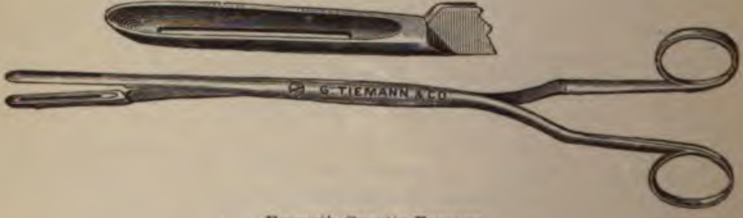
After the operation the patient should be kept perfectly quiet in bed for three or four days, and any tendency to inflammation at once met by the treatment appropriate to peritonitis.

Dangers of the Curette.—The dangers which attend upon the use of the curette are—

Peritonitis;
Cellulitis;
Atresia of the uterine canal;
Hemorrhage some hours after operation.

We have seen the first follow the use of the sharp steel curette, never of the wire. It should be guarded against by care after operation, perfect rest for several days, ice to the hypogastrium, and the free use of opium in case of pain. The second is likely to occur in cases in which cellulitis has existed in chronic form before resort to the curette. The third we have seen in one case after the whole corporeal and cervical lining was thoroughly scraped by the cutting curette. The fourth, which we have once met with, may readily be prevented by the use of a uterine and vaginal tampon, as described.

FIG. 158.



Emmet's Curette Forceps.

Emmet, in the hope of avoiding these dangers, recommends in place of the curette the use of a pair of forceps with cutting edges shown in Fig. 158. By these the fungoid growths are seized and removed by alternate separation and approximation of their blades.

We have seen a severe pelvic inflammation follow sharp curetting of the cervical cavity, even, in several instances, when all the usual precautions against infection and inflammation had been carefully observed and the patients put to bed at once with an ice-bag over the hypogastrium. We have learned, therefore, to be scrupulously careful even in apparently trivial operations, so as to avoid any possible evil result.

CHAPTER XXVI.

LACERATION OF THE CERVIX UTERI.

Definition.—This lesion consists in the traumatic division of the lips of the intra-vaginal portion of the cervix to a greater or lesser depth, and involving all or a portion of the tissues of the part. Lacerations of the upper portion of the cervix, not involving the external os, are not included in the injury now under consideration, being classed under the head of *rupture* of the parturient uterus.

History.—It has long been known that during the last part of the first stage of labor, as the presenting part of the child escapes from the uterus and enters the vagina, the circular fibres of the os externum and of the vaginal portion of the cervix not infrequently give way under the excessive distension which occurs, and lacerations in one, two, or more directions take place. In 1851, Sir James Simpson[1] drew attention very fully to this subject, pointing out the facts that lacerations of the cervix uteri are of very frequent occurrence, that they are not the result of mismanagement, that they are so common after first labors as to be regarded as reliable signs of labor having occurred, and that they may be complete or may involve only the mucous and middle coats of the cervix.

Some of the evil results of the condition too were recognized, as will be seen by reference to Dr. Gardner's work upon sterility (published in 1856), where it is credited with the causation of hypertrophy of the cervix, ulceration, cervical catarrh, sterility, and abortion.

Prof. Roser of Marburg in 1861 wrote of "ectropium" of the cervix as a cause of so-called ulceration of that part, but failed like his predecessors to recognize its true significance.

But the important pathological bearings of this accident upon disorders of the uterus has been appreciated only of late years. The credit of having recognized the significance of the lesion, and of having furnished us with a safe and efficient means of cure, belongs to Dr. T. A. Emmet. The future of his operation for its relief will unquestionably be a long and brilliant one, and its results will effect a great deal of good for uterine pathology. Dr. Emmet, after having performed the operation for seven years, published his first paper upon it in 1869. It was not, however, until a second paper by him in 1874 that the importance of his discovery was fully appreciated. Since that period the operation has gradually risen in favor, although the significance of the injury has undoubtedly been exaggerated by many who have performed the operation for its cure without a proper appreciation of the indications. We are now gradually arriving at the correct level, and it is surely not too much to say of it that this discovery constitutes one of the most important contributions to gynecology which has ever been made.

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[1] *Edinburgh Journ. of Med. Science,* p. 488, and works of Sir J. Simpson, Am. ed., p. 452.

Etiology.—The rapid forcing of the presenting part of the child through the, in such cases, as yet imperfectly dilated cervical canal and external os is the cause in the large proportion of instances of the laceration. Early rupture of the membranes before the cervix has become softened, dilated, and retracted over the presenting part, and, above all, unusually severe and protracted expulsive efforts of the uterus, by which the child is rapidly forced through the cervical canal and perhaps out of the vagina, bear the chief blame in the production of a lacerated cervix. More or less important parts in the causation of this injury are played by a rigid os, faulty development of the cervix, cystic disease of that part, cicatricial induration, and hyperplasia. The unskilful use of the obstetric forceps may also cause this accident, although but a small minority of the cases occur in this manner.

It is natural for a woman, when informed that her cervix is lacerated, to blame her physician for not having prevented it or repaired the injury at once. Of course we always follow the rule of exonerating the medical attendant from any blame in connection with the accident, but we cannot in our own minds do the same for him for not having attended to the subsequent treatment—that is to say, possibly operation of the laceration. Therefore we advise that every woman in whom examination made immediately after confinement shows a laceration of cervix or perineum should be again examined several months later in order to ascertain whether the injuries referred to require treatment or operation.

We do not think that we exaggerate when we say that all fissures of the cervix which give rise to symptoms or produce pathological changes in the pelvis are the results of parturition. The division of the cervix by scissors or the knife for the cure of sterility will never result in an organ so deformed as to require repair unless the operation has been unjustifiably severe. Strange to say, laceration of the cervix occurs not only during normal parturition at term, but also in consequence of the forcible expulsion of an ovum through the unprepared lower segment of the uterus at as early a period as two or three months. We have met with a number of cases of severe laceration of the cervix produced by such early abortions. Usually, laceration of the cervix occurs during the first confinement, each subsequent one more or less increasing the depth of the tear. [My case-books give, of 612 lacerations in parous women, 146 primiparæ and 310 others in whom the symptoms dated from their first child.—P. F. M.]

Pathology.—The first pathological result of a parturient laceration of the cervix is subinvolution of the uterus, either of the cervix alone or of the whole organ. Eventually, hyperplasia of the uterus follows the subinvolution, and the uterine adnexa, ovaries, tubes, ligaments, and cellular tissue take part in the process of defective involution and chronic hyperæmia. We thus have relaxed ligaments, congested ovaries and tubes, and œdematous cellular tissue. In course of time the heavy uterus drags on the lax ligaments, and a displacement occurs. The ovaries change their hyperæmia to hyperplasia, and the slightest accidental impulse may light up an inflammatory process in the ovaries, cellular tissue, or peritoneum. In some cases a firm, dense cicatrix covers the laceration and compresses terminal nerve-filaments, which by means of their communications with the spinal and sympathetic systems produce reflex neuroses in the pelvis, down the thighs, along the back, and in different portions of the body. The relations between some of these neuroses and the laceration is often so mysterious as to be inexplicable, but numerous cases are on record in which the repair of the laceration by a plastic operation has secured a cure of the neuroses. These neuroses may be either physical or mental. Emmet claims that general anæmia from defective innervation of the nutrient organs is one of the results of reflex neuroses from a lacerated cervix.

If a lacerated cervix does not cicatrize over, its lips may undergo cystic or papillary hyperplasia or both ; the separated lips evert, the mucous membrane lining the cavity of the cervix is rolled out, its epithelium is gradually rubbed off, and a hyperplasia of the cysts and papillæ of the exposed mucous membrane takes place. From this swollen, granulating surface oozes a profuse glairy discharge and slight traumatic hemorrhages are frequent. This hyperæmic and hyperplastic condition often extends upward to, and even beyond, the internal os, and cervical and corporeal endometritis result, in the latter affection frequently attended by the formation of fungosities. In consequence we have menorrhagia, which may become so profuse as to endanger the life of the patient. One other possible result of laceration of the cervix merits attention—namely, the tendency of the raw bleeding surface to undergo malignant degeneration. Breisky and Emmet have called attention to the frequency with which epithelioma of the cervix was found in conjunction with a laceration of the lips of that part, and our own experience decidedly confirms their observations. Certainly, all these pathological conditions are sufficiently grave to give to laceration of the cervix a prominent place in the production of utero-pelvic disease.

In a certain proportion of cases laceration of the cervix produces none of the symptoms above described. Quite recently, Noeggerath,[1] who for years ignored the importance of this lesion in the production of pelvic disease, has published a lengthy paper in which he attempts to prove, from extensive statistics drawn from his own practice, that laceration of the cervix is of absolutely no consequence whatever; in fact, his conclusions seem to indicate that it was rather beneficial to the average woman under his care than otherwise. [Feeling that his deductions were false, entirely unwarranted, and likely to place the subject in a wrong light, I induced my associate, Dr. B. H. Wells,[2] to tabulate a number of cases of laceration of the cervix from my own private case-books, the number being exactly double that used by Dr. Noeggerath for his conclusions, and as a result, taking each of Dr. Noeggerath's points up seriatim, Dr. Wells was able to prove that the conclusions of that writer were absolutely and positively incorrect and contrary to experience and logic.—P. F. M.]

We may safely say at the present day that it is entirely futile for any one who honestly and dispassionately considers this subject to deny the pathological significance of laceration of the cervix in its aggravated forms as a factor in the production of utero-pelvic disease. We ourselves know of no one other special lesion of the uterus—excepting, of course, malignant disease—which in our own opinion and experience is so productive of evil consequences as this one, nor of none which it is so easy to cure by the appropriate treatment to be described later on.

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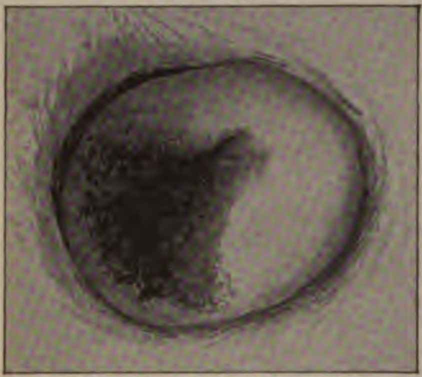
[1] Meeting of German naturalists and physicians, Wiesbaden, Sept., 1887.

[2] *Am. Journ. Obstet.*, xxi., 3, March, 1888, p. 257.

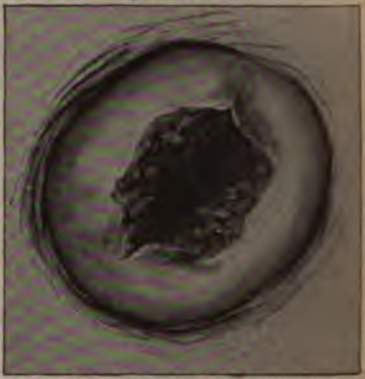
Frequency.—It may fairly be said that but few women are confined at term without sustaining some injury to the cervix, be it ever so slight. Goodell says that about one out of every six women suffering from uterine disease has an ununited laceration of the cervix. [I found among 2500 parous women (that is, those who had borne one or more children) 612 cases of well-marked laceration of the cervix, or about 25 per cent. Of these, only 280 were of sufficient depth to produce symptoms and require treatment. The proportion of deeper rents, therefore, or of such as were likely to produce the pathological symptoms already described, was less than 50 per cent.—P. F. M.]

FIG. 159.



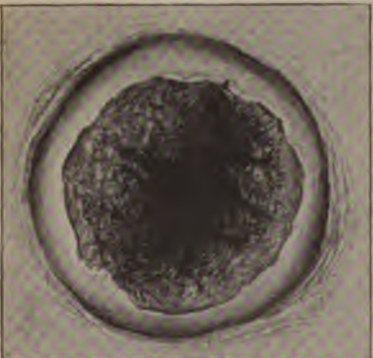
Unilateral Laceration of Cervix.[1]

FIG. 160.



Bilateral Laceration of Cervix, First Degree.

FIG. 161.



Bilateral Laceration of Cervix, Second Degree.

Varieties and Degrees.—The parturient cervix uteri may be lacerated in one or several places and at any point of its circumference. The forms of laceration usually met with are the following: unilateral, bilateral, anterior, posterior, stellate, multiple. Of these, the bilateral is the most common, and takes place on either side of the cervix toward the lateral vaginal pouch. The unilateral is most common on the left side, probably in consequence of the predominance of the left occipito-anterior presentations. [The relative frequency of these varieties and degrees of laceration is as follows: Among the 612 cases mentioned, there were, bilateral, 340; unilateral, 120 (left 80, right 40); anterior, 7; posterior, 12; stellate, 11; remainder not noted. First degree, 272; second, 169; third or worst, 171.—P. F. M.]

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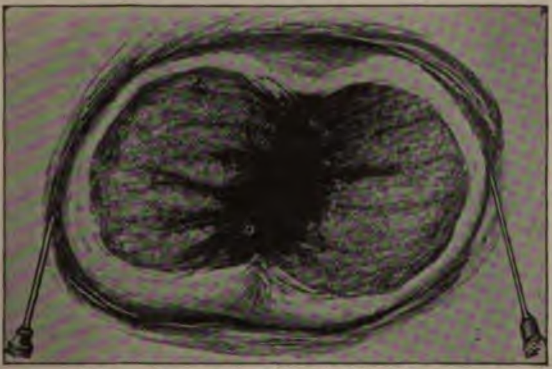
[1] All these figures of lacerated cervix are taken through Sims's speculum, with the patient on her left side.

Pathological Changes in the Lacerated Cervix.—In consequence of the laceration subinvolution of the cervix takes place. The numerous glands are closed and become distended with mucus and cause hypertrophy of the whole organ; the lips of the cervix roll out, the endocervical mucous membrane is exposed, becomes eroded and ulcerated or frequently very much hypertrophied, and as a result a chronic cervical catarrh is excited which gives rise to a profuse, discolored, glairy dis-

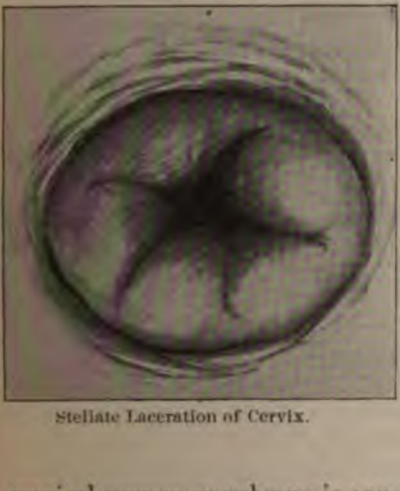
FIG. 162.



Bilateral Laceration of Cervix, Third Degree.

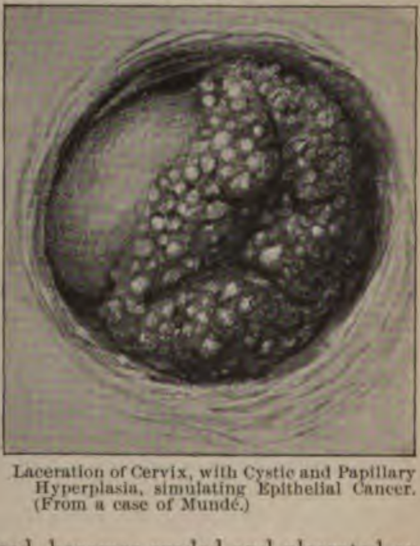
The tenacula are inserted in the anterior and posterior lips to show how the lips can be brought together and the natural shape of the cervix restored.

FIG. 163.



Stellate Laceration of Cervix.

FIG. 164.

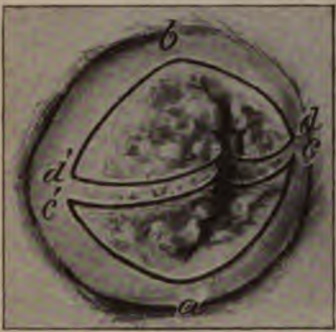


Laceration of Cervix, with Cystic and Papillary Hyperplasia, simulating Epithelial Cancer. (From a case of Mundé.)

charge. This condition was formerly mistaken for ulceration, and is so described in nearly all the older books published before the true significance of the lesion was recognized by Emmet. We are of the opinion that in women who have borne children the larger proportion of cases of cervical endometritis are due to the laceration of that part and the pathological changes directly following.

Symptoms.—The physical signs which may be present as the result of a laceration of the cervix are either local or general or both.

FIG. 165.



Outline of wedge-shaped flaps excised in Trachelorrhaphy for areolar hyperplasia of lacerated cervix: a, left angle; b, right angle: $a\ c'\ c$, left denudation: $b\ d'\ d$, right denudation; c' and c, and d' and d are brought together by sutures respectively.

Local.—Dull pain in the back, sacrum, and lumbar region; a sensation of weight, bearing down, or dragging in the pelvis; pain in the ovarian regions, hips, and thighs; leucorrhœa, chiefly of the cervico-uterine variety; menorrhagia, occasionally metrorrhagia, especially after coition; dyspareunia, sterility, and habitual miscarriage.

General.—The longer the laceration has existed, the greater its degree, the more marked the local symptoms, the more will the general health of the patient be affected, and in course of time a most decided state of anæmia, in consequence of which digestion suffers, and chronic invalidism will set in. The influence of the so-called cicatricial plug in the upper angle of the laceration as a factor in producing the general anæmia is insisted upon chiefly by Emmet, although many other gynecologists dispute the correctness of his views. While we have seen cases which decidedly confirm Emmet's theory, we are still not entirely converted to it, and are more inclined to attribute the improvement in the general health of such patients after trachelorrhaphy to moral influences. Still, we would like to leave this question for the present unsettled.

Diagnosis.—This may be made either by the touch, or by the speculum, or both.

By the Touch.—It is hardly necessary to describe how a laceration of the cervix can be detected by the examining finger. Instead of the normal, pointed vaginal cervix with a small circular or transverse external os at its tip, the finger feels an open cavity with more or less separated lips, between which the index can be readily inserted, in extreme cases almost up to the internal os. In the angles of the rent the finger touches hardened tissue, pressure upon which produces pain, often radiating into the pelvis and down the respective thighs. Instead of being conical, the cervix in aggravated cases is broad, the everted lips completely filling the vaginal vault.

Through the Speculum.—A more or less raw, bleeding surface is exposed to the eye, which naturally gives the impression of what was formerly believed to be ulceration of the os. Through the cylindrical or even the bivalve speculum the true character of the lesion is difficult to recognize, because the outer limits of the separated lips are not included in the lumen of the speculum; but through a Sims speculum the whole cervix is freely exposed and the relations of the lips to each other made clear. The confirmation of the diagnosis attained by the finger and the eye is secured by means of two tenacula, one hooked into each lip, which on being approximated at once restore the lips to their normal position and the cervix to its natural shape. In this way it is easy to avoid mistaking a superficial erosion of the lips of the cervix for a laceration; but it takes a practised examiner to distinguish between a lacerated cervix with cystic or papillary hyperplasia, and an erosion in a nullipara.

Differential Diagnosis.—Besides the condition just mentioned, the only other which we know of as likely to be mistaken for something else than a lacerated cervix is that known as epithelioma; and this mistake can be made only in cases where an excessive development of the glands and papillæ of a lacerated cervix so closely simulates malignant disease that the diagnosis can only be settled by the microscope. Congenital malformation of the cervix simulating a laceration has been observed by Fischl of Prague in a still-born infant, and we [P. F. M.] have seen such a case in a virgin of sixteen years.

Evil Results of Laceration.—The majority of the pathological conditions induced by laceration of the cervix have already been described, and we will merely re-enumerate them: subinvolution of the cervix or the whole uterus, cervical and corporeal endometritis, papillary and cystic hyperplasia of the cervix, uterine fungosities, menorrhagia, uterine displacements, chronic periuterine cellulitis and peritonitis, neuralgia of cervix, chronic ovaritis, and epithelioma. Two other conditions remain to be mentioned—namely, incapacity of conception or absolute sterility, and its converse, the tendency to abortion or virtual sterility. At first sight it may seem strange that these two conditions, sterility and a possibility of conception, should result from the same pathological process. On the one hand, the laceration forbids conception; on the other, it permits it, or even facilitates it, by means of the unusual gaping of the cervical canal. But the explanation is easy when we consider the subsequent changes in the cervical cavity and their consequences. The thick, semi-purulent mucus indicative of cervical endometritis effectually plugs the uterine canal against the entrance of spermatozoa, and therefore produces sterility; besides, the purulent secretion may injure the vitality of the spermatozoa. But supposing this mucous plug to be temporarily removed, coition takes place, and conception follows; the gaping internal os and the irritable uterine cavity, however, soon prove as efficient factors against the continuance of the pregnancy as the cervical plug in the first instance acted as an obstacle to its occurrence. Before the gestation has advanced to the third or fourth month the irritable uterus contracts and expels its contents, and thus in both cases sterility is the result. As an additional reason for sterility the pain produced by the act of coition may be mentioned, the male organ bruising and irritating the sensitive cervix. Of course there are numerous cases where women conceive readily and carry their children to term with lacerations of the cervix even of the most aggravated degree, but these cases merely emphasize the old adage that exception proves the rule.

Prognosis.—Untreated, many cases of laceration of the cervix cicatrize over and become entirely insignificant, but the rule undoubtedly holds good that a lacerated cervix, if the lesion is of a major degree, will eventually produce some pathological result which will attract attention to it and call for its relief.

Significance.—We have already mentioned that Simpson, Gardner, and Roser preceded Dr. Emmet in their description of this accident; but no one can dispute the claim of Dr. Thomas Addis Emmet to the first recognition of the true character, importance, and cure of laceration of the cervix. Undoubtedly, the true importance of this lesion has been exaggerated by many enthusiastic operators, chiefly such as were anxious to make names for themselves as gynecological surgeons, but at the present day, with few exceptions, the true significance of this condition is acknowledged by the large majority of fair-thinking and progressive gynecologists all over the world, and it is described in all of the prominent textbooks published during the last ten years. Our own conviction may be briefly stated in the following sentence:

The significance of a cervical rent as a cause of uterine disease lies not in the existence of the rent itself, but solely in the symptoms which it produces and in the direct influence which can be traced to it as the prime factor in the production or maintenance of some pathological condition or functional derangement in the pelvic organs or elsewhere in the body.

What special condition of, or change in, the cervix produces such pathological results the gynecologist must seek to determine in each individual case. If careful examination fails to trace any relation between the cervical lesion and the objective signs, common sense will lead us to seek elsewhere than in the cervix for the primary cause. Thus a deep laceration with all the tissue-changes above described may occasionally produce no local or general symptoms whatever, and, on the other hand, a comparatively shallow cicatrized fissure may be the source of an ovarian, sciatic, or supraorbital neuralgia. From our experience we have come to the general conclusion that of all the women who have a lacerated cervix during confinement, one-half or 50 per cent. suffer no inconvenience whatever from the injury, either because it was slight and healed spontaneously, or because the involution was so complete as to reduce the originally complete rent to a comparatively trivial nick. Of the remaining 50 per cent., one-half or 25 per cent. of the whole number for a time present some of the symptoms above described, then gradually recover spontaneously or require palliative local treatment before they are relieved. Of the remaining 25 per cent., one-half *may* be curable by appropriate local treatment, but will eventually require the radical operation for a permanent cure, and the last half, or 12½ per cent. of the whole number, are absolutely incurable otherwise than by the radical operation. It thus appears that we consider only one-half of all the lacerations of the cervix which occur as producing symptoms and requiring treatment of any kind, and of these but one-quarter, or one-eighth of all lacerations, as absolutely requiring Emmet's operation.

Surely we cannot be reproached with exaggerating the significance of the lesion or of the necessity for its operative treatment!

Treatment.—This may be divided into palliative and radical.

Palliative Treatment.—By palliative treament are understood all the remedies which tend to relieve the local pathological conditions in the cervix, always excepting the laceration itself. Thus by it the hyperæmia is diminished, the cervical catarrh is cured, the cystic and papillary hyperplasia and the erosion of the everted lips are healed, the cicatrix is softened and reduced, and the reflex neuroses are relieved; and secondarily, subinvolution and hyperplasia of the whole uterus, chronic ovarian congestion, and chronic pelvic inflammation are all benefited and perhaps entirely cured, and in addition the displacement of the uterus, the relaxation and prolapsus of the vaginal wall, and the chronic vaginal leucorrhœa are improved. It is evident, therefore, that treatment which does all this is by no means useless, and still the laceration of the cervix remains practically the same and improvement is but temporary.

The remedies which are to be employed in this course of palliative treatment are the following: 1. Hot vaginal douches; 2. Occasional scarification of the cervix; 3. Painting the cervix and vaginal vault with tincture of iodine twice a week, followed by a tampon saturated with glycerin or a solution of boric acid in glycerin; 4. Removal of the hypertrophied glands by the sharp curette, or their puncture and the application of nitric acid, iodized phenol, or tincture of iodine; 5. The application of tannic acid, or tannin and iodoform equal parts, to the cervix two or three times a week, followed by a dry tampon; 6. The introduction of a proper pessary if the uterus is displaced.

This palliative tratment may occupy several months, and, as we have already said, is usually merely temporary in its results. In many cases the pathological changes referred to are such as to render an immediate operation for the repair of the laceration inadvisable, since primary union would probably not take place. The palliative treatment, therefore, above described is indicated in such cases in order to prepare the organ for a successful radical operation.

Indications for Trachelorrhaphy.—It is a difficult matter to lay down a strict indication for the radical operation of a lacerated cervix. The best general indication which we can formulate for this operation is similar to the conclusion given when speaking of the significance of the lesion—namely, *the mere existence of a laceration of the cervix does not call for the radical operation; the indication for that measure depends entirely on the depth of the rent, on the degree of eversion and the amount of erosion and hyperplasia of the torn lips, on the intensity of the symptoms unquestionably or probably depending on it, and on the improbability of these symptoms being permanently cured by other than radical treatment.*

[In an article in the January (1879) number of the *American Journal of Obstetrics* on "The Indications for Hystero-Trachelorrhaphy" I specified a few indications for the operation, which I will briefly enumerate here as additions to or modifications of those already mentioned: 1. Slight lacerations, with persistent profuse cervical leucorrhœa. 2. Slight lacerations in subinvoluted or hyperplastic uteri where trachelorrhaphy is expected rather to reduce the size of the uterus than merely to cure the rent. 3. Hyperplastic or cystic ectropium of one lip. Here the enlarged lip is simply excised and the raw edges are brought together by sutures. 4. Laceration of the cervical wall of greater or lesser depth, not extending to or through the lips of the os; the result is a gaping os and a dilated, paralyzed cervix. By slitting the lips bilaterally up to the vaginal vault, trimming off diseased mucous membrane, and sewing together the raw surfaces a speedy cure can be achieved. 5. Erosions, catarrhal, granular, and follicular, of the cervix found in nulliparæ, which are well known to be exceedingly obstinate to the usual caustic and astringent treatment. By trimming off the eroded surface and uniting its edges with sutures a much more rapid and certain cure can be attained than by the old methods. (For colored plates illustrating the various degrees and forms of laceration I would refer to the article mentioned.)—P. F. M.]

Operation.—While the operation for the repair of a lacerated cervix is neither a serious nor dangerous surgical procedure, it nevertheless requires more technical skill and dexterity than any other gynecological operation, and the instruments necessary for it should be in every way the best to be procured. The following instruments are necessary:

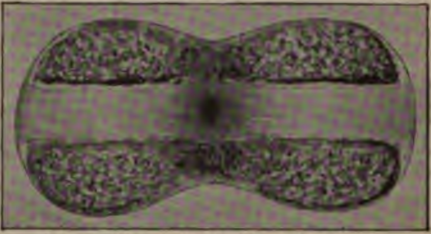
A broad, short, flat Sims speculum;
A depressor with wooden handle;
Two solid steel tenacula;
Two Emmet's small curved cervix scissors, right and left;
One Emmet's stout needle-holder;
One Mundé's counter-pressure hook;
One Emmet's twisting forceps;
One Sims's shield;
One pair of stout wire scissors;
Six Schnetter's cervix needles, long and medium, curved, and straight.
Six Sims's or Hanks's cervix needles;
Braided silk, medium size;
Pure silver wire, No. 27, several coils;
Six metal sponge-holders;
Fine graded cheap sponges, to be cut into suitable pieces;
One Simpson's sound.

[I generally operate through my flanged Sims's speculum.—P. F. M.]

Assistants.—Four assistants are needed, two of whom—the one in charge of the ether, and the one to hand instruments and thread needles—must be physicians; the other two can be nurses, one of whom holds the speculum and the other washes and hands the sponges.

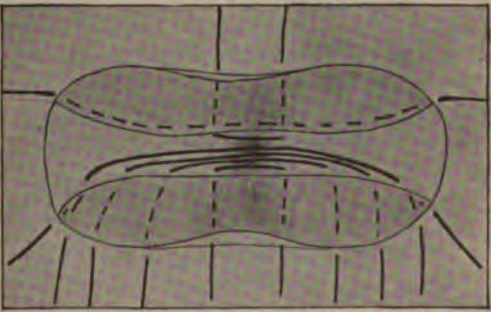
Preparation of the Patient.—The usual rules to be observed before every operation on the female pelvic organs apply also in this case. The bowels have been thoroughly moved, the meal preceding the operation is omitted; a copious hot vaginal douche has been given just before the hour fixed for the operation, and the patient is dressed simply in her night-clothes. We usually give an anæsthetic, although we have performed the operation a number of times without it in cases where cardiac or pulmonary disease contraindicated the use of anæsthesia or the patient absolutely refused to take it. The cervix is not so very sensitive but that a patient of ordinary fortitude can stand the pain of this operation; still, we prefer the anæsthetic unless there are excellent reasons for omitting it. The operation is performed through a Sims's speculum, with the patient in the left latero-abdominal position. The operator first seizes the anterior lip of the cervix with a tenaculum, and pares the lower or left half of this lip down to the angle in the median line, and carries the denudation over a corresponding surface on the posterior lip, endeavoring to make the two denuded areas as nearly alike as possible. He then repeats the same procedure on the upper or right portion of the lacerated cervix, leaving a strip about a quarter of an inch wide of denuded tissue on each lip of the cervix for the future external os and cervical canal. (See Figs. 165 and 166.) If troublesome bleeding occurs during this procedure, a deep wire stitch may at once be passed through both lips of the cervix above the angle and twisted, which will compress the circular artery and effectually stop the bleeding. Having trimmed off the flaps thus described, the lips of the cervix should be brought in apposition by two tenacula in order to see whether they can easily be approximated by the sutures. All retention-cysts—so-called ovula Nabothi—which appear on the surface of the wound should be carefully excised, as they interfere with union. The sutures are then introduced, the first being passed through the upper angle of the rent, and each successive one through the whole depth of each lip until all the sutures needed for the upper or right half of the tear have been inserted; then the stitches for the lower or left portion of the rent are inserted, beginning again with the angle. The stitches of the upper portion of the rent are first twisted, the ends being bent down against the anterior lip and cut off short, so as not to injure the anterior vaginal wall. (See Figs. 167 and 168.) In forcing the needle through the lips of the cervix, chiefly the posterior, the counterpressure-hook (see Fig. 119) will be found of great service. From two to

FIG. 166.



Area of Denudation in Trachelorrhaphy.

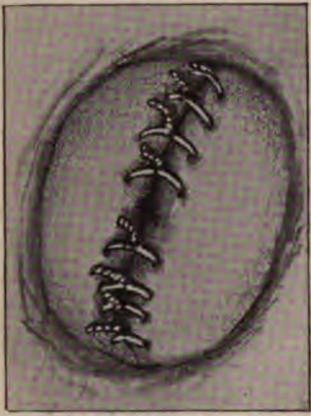
FIG. 167.



Introduction of Sutures in Trachelorrhaphy.

four stitches will usually be needed for each side of the tear. Care should be taken not to twist the sutures too tight, to avoid puckering between them, and if the tissues appear blanched to loosen them before leaving the patient. The operation may last in easy cases but fifteen minutes, but often may occupy thirty minutes or more. After it is finished the vagina is irrigated with a hot douche of 1 : 5000 corrosive sublimate, an aseptic pad is put over the vulva, and the patient placed in bed. We usually keep an ice-bag over the suprapubic region for twenty-four hours as a guard against possible inflammatory reaction. If it was found necessary to remove all the mucous surface from both lips, or to scrape the cervical cavity with the curette, and contraction of the external os is thus to be apprehended, a glass or hard-rubber stem may be inserted, and kept *in sitû* for a week by a tampon of iodoform gauze.

Fig. 168.



Sutures Twisted and Cut Short after Trachelorrhaphy.

The patient is allowed to pass urine herself, even to the extent of letting her sit upon the vessel if necessary, but if she is unable to relieve herself in this manner the catheter must, of course, be used. She is kept in bed for at least a week, probably nearer two, a tepid 2 per cent. carbolized vaginal douche being given once or twice daily if there is any discharge.

[Formerly I was in the habit of removing the sutures about the seventh or tenth day; but, having witnessed several instances where the apparently perfectly united lips separated again immediately after the withdrawal of the stitches, I have for several years followed the plan of leaving them in for three weeks or longer, allowing the patient to get up and walk about, and even come to my office for the removal of the stitches. If menstruation came on, as would probably be the case between the second and third weeks after the operation, the stitches were allowed to remain until the flow had ceased. Since I have adopted this plan I have found more satisfactory and firmer union than when I removed the stitches as early as was formerly my practice.—P. F. M.]

The bowels should be kept regular after the operation by mild laxatives or enemas. Usually there is very little pain following this operation, and unpleasant consequences need scarcely be anticipated. Of late, if there was a displacement present, usually a retroversion, we have been in the habit of replacing the uterus immediately after the operation and inserting a pessary, which we allowed to remain until the stitches were removed and perhaps longer, and have not found it to interfere in any way with the healing of the wound.

Results achieved by Trachelorraphy.—Of course, not every disease that female flesh is heir to is due to a laceration of the cervix uteri and is curable by repair of that lesion, but we can confidently assert that we have many times seen the following conditions relieved and cured by this operation: Subinvolution and hyperplasia of the cervix and of the whole uterus, the organ diminishing from three and a half to two and a half inches within several months after; cervical and corporeal endometritis; menorrhagia, provided curetting of the endometrium preceded the repair of the lacerated cervix; chronic ovarian congestion; reflex neuroses; general anæmia. As regards the influence of the operation on sterility, we are not willing to claim that it cures this condition with any degree of certainty; still, we have seen many cases where conception followed the operation so rapidly as to lead us to believe that the removal of the diseased condition of the cervical canal had a large influence in favoring that occurrence. Certainly the operation does not prevent conception, except when the operator has done his work too well and closed the external os so tightly as to prevent the entrance of spermatozoa.

Dangers of the Operation.—Although ordinarily trachelorrhaphy is neither a serious nor dangerous operation, still, our own experience and that of a number of perfectly competent operators obliges us to say that at times it may be attended and followed by serious complications, which in a few instances have even resulted in death. Dr. B. Hughes Wells investigated the subject at our instigation some years ago,[1] with the result that he found reported 43 cases of pelvic inflammation (34 cellulitis, 9 peritonitis) with 6 deaths occurring in the practice of Drs. Hunter (4 with 1 death), Goodell (7 with 3 deaths), Mann (3), Mundé (4 with 2 deaths), Emmet (1), Reamy (6), Jackson (3), and some others. The cause of death in all cases was general peritonitis. [I have seen three cases of very severe secondary hemorrhage following the operation, probably due to the cutting of a deep branch of the circular artery by one of the stitches; only the introduction of deeper sutures succeeded in arresting the bleeding. Emmet, Pallen, and Goodell each report a similar experience.—P. F. M.]

Occasionally the operation fails, either in consequence of the fault of the operator, who has introduced too many stitches or has twisted them too tightly or has omitted some surgical precaution, or in consequence of poor general health of the patient. Wells's statistics show 637 operations with 44 failures, or about 6.9 per cent.

Of course a subsequent labor, especially if conception soon follows the operation, may result in a relaceration, but this is no more the case than during any first confinement. Wells's statistics show that of the 77 cases where the condition of the cervix was noted after labor following the operation, 62, or 80 per cent., were not relacerated, while of the remaining 15, 8 were but slightly torn.

The question is so often asked us, What will result if a lacerated cervix which we have pronounced as requiring operation is not repaired? that it is worth while for us to say that in the majority of instances no danger to health is likely to result from the non-performance of the operation. The patient will merely continue in the condition of invalidism for the relief of which she applied to us until the arrival of the menopause, when probably her symptoms will gradually subside.

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[1] See *American Journ. Obstet.*, June, 1884.

Whether it is worth her while to live so many years of discomfort and misery, when she could be easily and safely relieved by a comparatively trifling operation, is for her to decide. One further danger which such patients run we have already referred to—namely, the undoubted tendency of a lacerated, eroded, and hyperplastic cervix to undergo malignant degeneration. Having pointed out this risk to the patient, our duty is accomplished.

Occasionally a severe laceration heals spontaneously, but it is impossible to foretell when that is likely to occur.

CHAPTER XXVII.

GENERAL CONSIDERATIONS ON DISPLACEMENTS OF THE UTERUS.

History.—That the earliest practitioners of medicine were familiar with this subject is abundantly attested by the writings of the Greek and Roman schools. It is distinctly mentioned by Hippocrates, and more clearly and exactly still by Galen and Moschion about the second century of the Christian era. This remark applies not only to prolapse, but also to versions, which were evidently understood. Hippocrates and Moschion even described latero-version, a variety which has not been much noticed by modern writers, and Aëtius[1] in the sixth century indicates the method for reduction and retention in place of the retroverted womb. Although certain passages in the works of these old writers seem obscurely to refer to bending of the uterus upon itself—such, for example, as one in which Hippocrates speaks of cases in which "*uterorum os conclusum, aut contortum fuerit*"—there is no satisfactory evidence that they understood the difference between versions and flexions.

Passing over many centuries, at the middle of the eighteenth we find gynecologists paying attention to versions, and even to flexions, of the pregnant uterus, but losing sight of these displacements in the non-pregnant organ. Versions were at that period described by Gartshore, W. Hunter, Jahn, and Desgranges, and flexions by Saxtorph, Wiltczek, Baudelocque, and Böer. Gartshore describes a case of retroflexion complicated by retroversion, but the flexion appears to have made little impression upon him. In 1775, Saxtorph wrote an essay entitled *De Ischuria ex utero retroflexo*, describing a case with autopsy, but the words "orificium alte supra pubem reperi" show that it was not a true case. About the same time Wiltczek published an unquestionable case "de utero retroflexo," but it occurred during utero-gestation, and hence does not concern our inquiry. Both in England and France the subject of displacements attracted great attention at this period. "At this time Chopart upon his return from England, where he became well acquainted with W. Hunter, informed the Academy of

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[1] *Tetrabiblos*, ch. lxxvii.

Surgery what progress was being made in a subject which had attracted attention in France thirty years before."[1]

Denman was the first writer who described flexion of the non-pregnant uterus, which he did in reference to a case of retroflexion about the year 1800. The wanting link, the description of anterior flexure, was not supplied until M. Améline of France described anteflexions in 1827. After this many others added to the knowledge of the subject, which soon assumed its place in systematic medical literature. A great deal was done for it by the introduction of the uterine sound as a means of diagnosis and of reposition.

In carefully perusing more modern literature with reference to its contributions to uterine flexions, we are impressed with the belief that we are indebted to none more fully than to Cusco, whose very valuable thesis we have alluded to, and Graily Hewitt, whose views are familiar to all.

In this country the profession is generally indebted for correct views upon the subject to Dewees, Meigs, and Hodge. More especially has the last of these identified his name with it by important contributions to pathology and treatment.

Pathologicul Significance of Versions and Flexions.—The ancients ascribe to these displacements many constitutional evils, as paralysis, hysteria, etc., and even until a very recent period they were credited with a great deal of pelvic pain and functional uterine disturbance which it was supposed almost universally attended them. Until 1854 this belief prevailed very generally, having the powerful support and endorsement of such men as Velpeau, Simpson, and Valleix. It is true that it was contested by Cruveilhier and Dubois[2] before the period mentioned; but at that time a spirited discussion arose concerning it in the Academy of Medicine of Paris, which not only threw much doubt upon it, but gave rise to a powerful opposition, in the ranks of which appeared Depaul, H. Bennet, Aran, Becquerel, and others equally eminent. They maintained that these displacements of the womb, if unaccompanied by textural lesion, produced no constitutional disturbance, created, as a rule, no discomfort, and did not deserve the attention in treatment which had been bestowed upon them. They did not believe that the dislocation was the cause of suffering when this existed alone, but looked upon it in such cases as an epiphenomenon engrafted upon some important lesion. Consequently, they were opposed to reliance being placed upon support by pessaries as one of the essentials of treatment, as had been done by the other school.

When views supposed to be false are repudiated, those adopting new ones are always apt to run too far into an opposite extreme, and in this instance many have done so. Scanzoni[3] sounds the keynote of this extreme party when he states that "flexions of the womb do not acquire any importance, nor are followed by any serious dangers, save when they are complicated with an alteration in the texture of the organ."

The following propositions present the views upon this subject which we think will be found to bear the test of experience:

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[1] Cusco, *Thèse de l'Anteflexion et de la Retroflexion de l'Utérus*, Paris, 1853.

[2] Goupil, B. & G., *op. cit.*, p. 459.

[3] *Op. cit.*, Amer. ed., p. 112.

1st. Versions and flexions of the womb may, and not unfrequently do, exist without causing any symptoms, for in themselves they do not constitute disease. Thus it is that occasionally we see the uterus forced completely out of its place without the production of morbid signs.

2d. By interfering with escape of menstrual blood, by disordering uterine circulation and keeping up hyperæmia, by causing pressure and friction from contact with surrounding parts, and by creating a barrier to the entrance of seminal fluid, they become, as a general rule, of great importance and require special attention.

3d. Often being the results, as they are sometimes the causes, of uterine and peri-uterine diseases, their treatment should be combined with efforts at the alleviation of these states.

4th. Treatment by pessaries, combined with means which remove the weight of the superincumbent intestines, is of great value. By it, even although the primary disease is not affected, we may relieve one of its most troublesome symptoms, which often reacts for evil in aggravating and prolonging the affection which caused it. When the displacement has resulted from relaxation of the uterine ligaments in consequence of increased weight or pressure from the abdominal viscera, pessaries prove a most useful and efficient means of treatment.

5th. One reason for the great prejudice existing against the use of pessaries in the minds of many is to be found in the fact that most of the enlargements of the uterus were attributed unhesitatingly to parenchymatous inflammation. Mechanically lifting an inflamed organ appeared repulsive to reason. So long as the existing inflammation was uncured, efforts appeared to be directed to a side issue, a result and not the root of the disorder. Since it is now known that what was supposed to be chronic metritis is really a vice of nutrition resulting in new formation of connective tissue, this theoretical objection falls to the ground.

6th. Another reason is this: it requires skill and ingenuity, the result of practice, not only to do good with pessaries, but to apply them without doing absolute harm. In the hands of a physician who has made no special, or at least careful, study of their use, and who habitually applies only a half dozen in the course of every year, pessaries are elements of absolute danger. It would be as unreasonable to expect an untaught experimentor to fit the foot comfortably with a shoe as to hope for efficiency, comfort, and safety from a pessary applied by ignorant hands.

7th. The gynecologist who to-day assumes the position that pessaries are useless or worse, and treats uterine displacements without their aid, will fail, by reason of the absence of other means to accomplish the existing indications, to meet the requirements of his cases.

8th. A version, flexion, or prolapsus of the uterus being found on examination, which neither gives rise to present inconvenience nor causes the symptoms for the relief of which medical advice was sought, should nevertheless, if of one of the major degrees, be rectified if possible, on the general principle that a displaced or distorted organ is pathological, and may sooner or later cause serious trouble.

This rule, let it be distinctly understood, does not necessarily apply to virgins or to women beyond the menopause, and under no circumstances should it embrace cases where the treatment is likely to prove worse than the disease.

Definition and Synonyms.—The term displacement is applied to any decided removal of the uterus from its normal position, without reference to the direction in which it has been moved.

Anatomy.—One of the salient points in the comprehension of this most important subject consists in a clear understanding of the natural position of the healthy uterus. But, unfortunately, owing to the fact that the position of this organ varies constantly with inspiration and expiration, with muscular effort and quietude, and with fulness and emptiness of the bladder and rectum, it is difficult to arrive at common ground with reference to a point apparently so easy of settlement. As this chapter progresses we propose to put before the reader a diagram of the normal position of the uterus when not influenced by any decided disturbing cause. It is the result of long and careful investigation, and represents the truth, we think, more accurately than any other with which we are acquainted.

Let any one examine a healthy uterus by means of Sims's speculum, and he will recognize that it is delicately and perfectly poised near the middle of the pelvic cavity by such supporting influences that it is never, even for a few seconds, perfectly at rest. It ascends with expiration and descends with inspiration with such regularity and distinctness that one operating upon the pelvic viscera can, by this up-and-down movement, recognize at once when an anæsthetic is affecting respiration badly. Under the influence of more decided factors, such as pregnancy, repletion of bladder or rectum, or violent muscular efforts, still more marked changes of position occur to it. Nevertheless, we must agree upon a medium position as the normal one for a healthy uterus.

The mechanical influences which sustain the uterus and preserve its pelvic equipoise are five in number. These are—

1st. The retentive power of the abdominal cavity;
2d. The attachments to the areolar tissue of the pelvis;
3d. The juxtaposition of the other organs;
4th. The following ligaments:

a. The round ligaments, continuations of uterine tissue, extending from uterine horns to labia majora;

b. The utero-vesical ligaments, bands of pelvic fascia, and uterine muscular tissue passing between the bladder and the cervico-corporeal junction, where they attach themselves and prevent retreat of cervix;

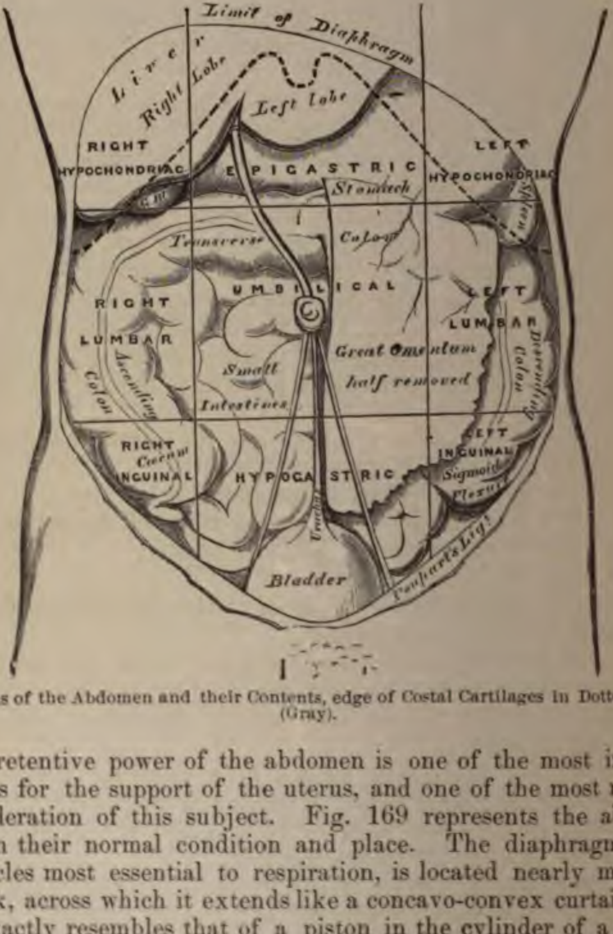
c. The utero-sacral ligaments, formed of hypogastric fascia and the uterine and vaginal tissue, extending from posterior surface of cervix, passing backward to be attached to sacrum, and preventing passage of cervix forward;

d. The broad ligaments, folds of peritoneum enclosing areolar tissue, ovarian and round ligaments, and ovaries, preventing lateral, anterior, and posterior displacements.

None of these means of suspension are concerned in flexions and inversions, which are combated by forces of an entirely different nature. The tissue of the normal, unimpregnated uterus is of such strong, resisting character in the adult female as to prevent too great a curvature of the body upon the neck, either anteriorly, laterally, or posteriorly. It is to this peculiarity of structure that immunity from these conditions is due.

When stimulated by pregnancy the uterine tissue develops rapidly into muscular structure. This keeps the cavity of the organ closed by tonic contraction, and removes the possibility of inversion unless it be accomplished by absolute violence. But when from any cause this contractile power is destroyed and the condition of tone is replaced by one of atony, flexion or inversion may occur.

FIG. 169.



The Regions of the Abdomen and their Contents, edge of Costal Cartilages in Dotted Outlines (Gray).

The retentive power of the abdomen is one of the most important influences for the support of the uterus, and one of the most neglected in consideration of this subject. Fig. 169 represents the abdominal viscera in their normal condition and place. The diaphragm, one of the muscles most essential to respiration, is located nearly midway in the trunk, across which it extends like a concavo-convex curtain. "Its action exactly resembles that of a piston in the cylinder of a pump."[1] As it contracts it forces the abdominal viscera downward directly upon

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[1] *Course of Lectures on Physiology*, by Prof. Küss, of University of Strassburg, p. 294.

he pelvis, and, as it relaxes and expiration occurs, the
abdominal viscera
eir former place,
he pelvic viscera
This up-and-down
not only keeps the
lace, but it exerts
stimulating influ-
its circulation, and
at tendency to slug-
hich perfect quie-
rkedly favors. In
the importance of
t cannot be over-
for we believe that
ble contributions to
of uterine displace-
e future will come
igations in this di-
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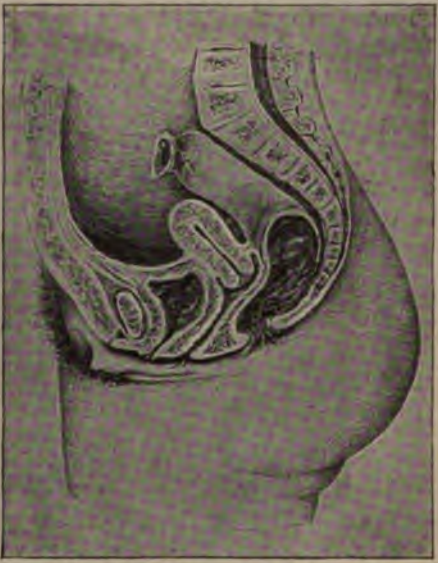
0 represents the re-
r experience as to
l position of the
bladder and rec-
ing entirely empty.

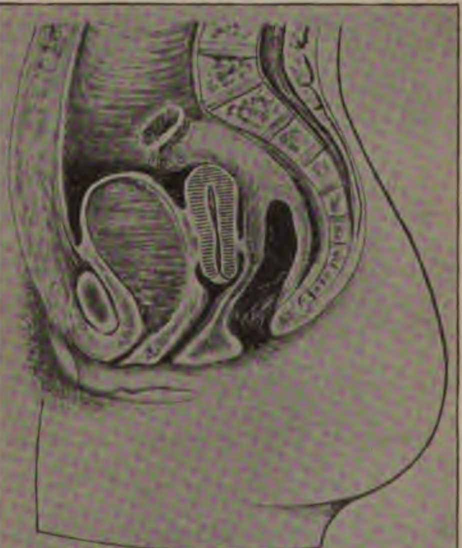
FIG. 170.



Normal Relations of the Female Pelvic Organs (diagrammatic).

lude in detail here to only one other factor in uterine support.
will be observed to
ghtly upon the ante-
wall, and to depress
This a rectal exami-
usually reveal as
The perineal body
mal, the posterior
ll will from this
ound, upon careful
ch, to rise up below
which will thus rest
hallow well or de-
e anterior cervical
supported, as if
, by the anterior
of this. This an-
ection of the pos-
nal wall may be
vaginal promon-
possibly may pre-
stacle to a descent
ix backward. It
orne in mind that
of the uterus is not accomplished by one or two powerful

FIG. 171.

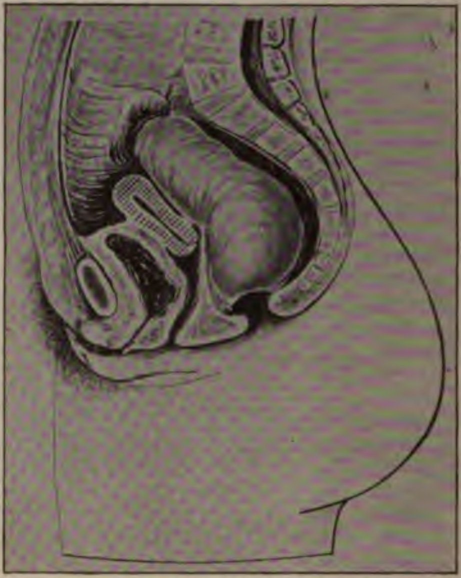


Pelvic Organs with Distended Bladder.

factors alone, but by a combination of several, each working toward a common end.

This very fact makes it manifest that a number of mechanical influences may force an organ thus sustained upward, downward, laterally, or even bend it upon itself or turn it completely inside out, and that the direction of the impelling force or nature of the loss of support will determine the character of the displacement. The displacements which may thus result have received the following appellations:

FIG. 172.



Pelvic Organs with Distended Rectum.

Ascent;
Descent or prolapsus;
Anteversion:
Anteflexion;
Retroversion;
Retroflexion;
Retroposition with anteflexion;
Latero-version;
Latero-flexion;
Inversion.

Having said this much in a general way as to displacements, let us say a few words with special reference to uterine flexions.

Version, or turning of the uterus, signifies the fact that its long axis has changed its normal direction in the pelvis. Flexion signifies the bending of the uterus upon itself, so that a decided angle is created in its long axis. One condition is a displacement, the other a deformity in the organ. One may be likened to a dislocation of one of the long bones, the other to a fracture with angular union of the broken extremities. The treatment of one involves merely restoration of a dislocated organ; that of the other rectification of a deformity which may have lasted for years or may even have been congenital.

Frequency.—Flexions of the uterus—that is, displacements anteriorly, posteriorly, or laterally—in which the decidedly predominating feature is flexion and not version, are very common:

In	339 displacements	Nonat	found	67	flexions.
"	84 "	Meadows	"	54	"
"	895 "	Mundé	"	337	"

As to the relative frequency of anterior and posterior flexions, the evidence is decidedly in favor of the former:

In	67 cases	of flexion	Nonat[1]	found	33	anteflexions	and 14	retroflexions.
"	54 "	"	Meadows[2]	"	20	"	and 34	"
"	54 "	"	Scanzoni[3]	"	46	"	and 8	"
"	23 "	"	Valleix[4]	"	11	"	and 12	"
"	296 "	"	Hewitt[5]	"	184	"	and 112	"

Out of 1670 cases of flexion collected by Ludwig Joseph[6] of Breslau, 1100 were anterior and 570 posterior. Out of 345 cases of flexion, Emmet[7] found 273 to be anteflexion, 29 to be retroflexion, and 43 to be lateroflexion. In 337 cases of flexion Mundé[8] reports 295 anteflexions, 33 retroflexions, and 10 lateroflexions.

Although the results are somewhat conflicting, the preponderance of evidence very decidedly favors anteflexion over retroflexion.

One reason why we should anticipate that retroflexion would be less frequent than anteflexion is that the natural anterior obliquity of the uterus favors the latter and opposes the former displacement. Another is the fact that the former is more thoroughly guarded against by ligamentous support, the round ligaments, running as they do from the horns of the uterus to the vulva, decidedly tending to prevent its occurrence. Not only do they do this: the uterus, being kept by them in anterior inclination, should softening of its structure occur or any direct force be exerted upon it, naturally bends forward.

If this be so, it may be asked why areolar hyperplasia so frequently results in retroflexion as well as in anteflexion. One reason is because the first effect of the increased uterine weight attending that disease is descent of the uterus. This relaxes the round ligaments, tends to bring the uterine axis in coincidence with that of the middle of the pelvis, and favors retroflexion. For a time the tendency is to descent and coincident retroversion. This continues until the progress of the cervix is checked by the utero-sacral ligaments. Then the heavy body bends, the weakened tissue yielding at the os internum, and retroflexion results. Another reason is that flexion commonly follows parturition, at which time, attacking an organ with weakened tissues and relaxed ligaments, it meets with an efficient ally in the nurse, who favors retroflexion at the expense of anteflexion by zealously forcing the fundus backward by a tight obstetric bandage.

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[1] *Mal. de l'Utérus*, p. 416.

[2] *Am. Journ. Obstet.*, vol. i. p. 176.

[3] Klob, *op. cit.*, p. 69.

[4] Cusco, *Thèse*, p. 35.

[5] *Dis. of Women*, 2d Am. ed., p. 213. Hewitt includes versions with flexions. The other statistics refer to pure flexion.

[6] *Berlin. Beiträge zur Geburtshulfe und Gynäkologie*, vol. ii. part 2, 1873.

[7] *Prin. and Prac. of Gynecology.*

[8] "The Curability of Uterine Displacements," *Am. Journ. Obstet.*, Oct., 1881.

Thanks to the researches of Coste, Pouchet, Bischoff, and others, we are to-day well informed concerning the development of the uterus. Early in embryonic life a little duct shoots out from the external surface of each Wolffian body. These pass downward to unite and make a common canal, which becomes in time separated into uterus and vagina. Very soon a constriction appears, the neck of the uterus is formed, and becomes well developed, while a very small spot marks the point where the body is to show itself. The original canals become Fallopian tubes, and at the time of birth these, as well as the neck and body of the uterus, vagina, and other organs, have arrived at maturity. But it must not be supposed that the proportions of the adult uterus exist in that of infancy. The neck forms three-quarters of the organ, and the body, represented by a soft movable membrane, has no fixed position, but follows the bladder if upon opening the abdomen it is drawn forward, or the rectum if that viscus is pushed backward. Later in the life of the girl, even after she has reached puberty and menstruation has occurred, the uterus is curved forward; and this anterior inflexion lasts through life if a normal state continue, though it is generally diminished and sometimes overcome by puberty and utero-gestation.

In 1849, Velpeau, whose insight into gynecology was certainly remarkable, in a discussion before the Academy of Medicine of Paris declared that he had so often found an anterior inflexion of the uterus in healthy women that he was inclined to look upon it as normal. Upon this hint two of his pupils, Boullard (1852) and Piachaud (1853), with great assiduity investigated the subject, and determined that it is so in the child and virgin; the latter basing his deductions upon 107 cases. Boullard found it to exist in 80 female fœtuses and in 27 adult females. Verneuil and Follin subsequently confirmed these observations.

That this is the normal condition up to puberty is unquestionable, nor can it be denied that to a limited degree it is so even afterward in the unmarried female. But, as Cusco has pointed out, it greatly diminishes at puberty unless abnormal flexion is developed. Up to this time the neck of the uterus represents three-quarters of its entire bulk, and the whole organ is an insignificant element of the human body. At this time, however, it becomes an important organ. The body develops; its walls become thick, dense, and strong; "and," says Cusco, "this is an important point: if the development is regular its walls *establish an equilibrium;* the uterus straightens itself; its anterior concavity disappears; and there remains only a slight depression corresponding to the bladder." Up to this period of life curvature is unquestionably due to the want of tone and power which characterizes undeveloped uterine tissue, for even when anteflexion does not exist the organ is generally otherwise displaced. Thus, M. Soudry[1] in 71 post-mortem examinations of infants found the uterus anteflexed 41 times,

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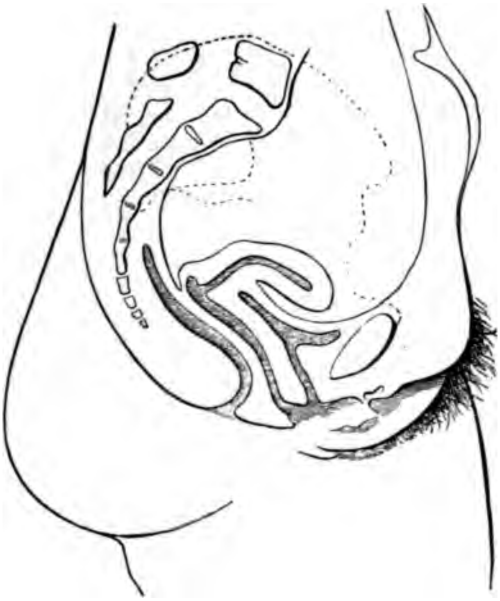
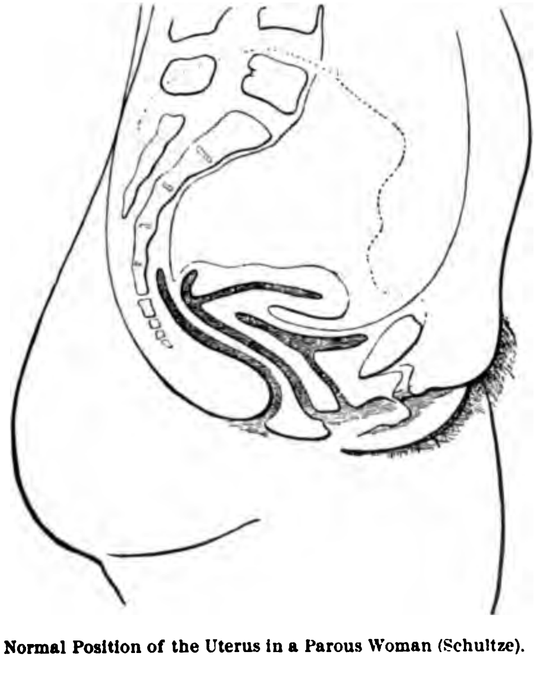
[1] Aran, *op. cit.*, p. 981.

FIG. 173.



Normal Position of the Virgin Uterus (Schultze).

FIG. 174.



Normal Position of the Uterus in a Parous Woman (Schultze).

anteverted 11 times, retroverted 15 times, retroflexed twice, and retroverted with anteflexion twice. According to Winckel,[1] who substantially follows B. S. Schultze's[2] views on uterine displacements, our present knowledge of the normal position of the uterus may be summarized as follows: When the bladder and rectum are empty, the virgin uterus lies with its fundus behind the symphysis pubis, the os uteri, about 2 centimetres (⅘ inch) anterior to the sacral promontory, and the vagina and cervix forming nearly a right angle (Fig. 173), while in the parous woman the angle is acute. In the erect posture the long axis of the uterus is, therefore, almost horizontal (Fig. 174). The whole organ is also somewhat twisted, the vaginal portion toward the left, and the fundus toward the right hand. Our observations do not permit us to agree with the conclusions of Schultze and Winckel, which Fritsch also accepts.[3] We think the anteverted position of the uterus which they consider normal to be decidedly exaggerated, and have given our idea of the normal relation of the female pelvic organs in Fig. 170. Still, we will retain the statement, from the evidence at present upon record—

1st. That anteflexion is the rule during early childhood;

2d. That it is quite frequent, in slight degree, in nulliparous women, without constituting disease.

For the prevention of versions certain pelvic ligaments are very effectual, but they have no power to prevent bending of the uterus upon itself. This is accomplished by the inherent strength and resistance of the proper tissue of the organ. Remove a normal uterus from the cadaver, balance it upon the cervix, and it will sustain itself perfectly; press it down by applying force to the fundus, and its own resiliency will cause it to erect itself immediately. Suppose a uterus to be composed of gutta-percha instead of living tissue; the material forming the walls of the neck will support the fundus when the pear-shaped bag is held by the stem or narrow part. To carry the simile further, so long as the proper tissue of the stem or neck remains normally strong, flexion will be impossible unless its resistance be overcome by direct physical force exerted by pressure or traction. But if some influence be brought to bear locally, so as to soften the part sustaining the fundus, it is evident that, as the gutta-percha walls grow weak, there may be a flexion of the fundus from its own weight. It will be said that these views represent the uterus as supported by the vagina, and leave out of consideration the broad ligaments which sustain the fundus. If these ligaments were tightly-drawn cords, we could admit their action, but as they are merely lax folds, which are not made tense by the bending of the uterus upon itself, we do not do so.

A corroboration of this view is found in the frequency of flexions in the uteri of the aged which have lost tone and strength. "In aged women," says Klob,[4] "with exceedingly relaxed uteri, the pressure of the intestines upon the posterior surface of the organ is sufficient to cause anteflexion."

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[1] *Diseases of Women*, authorized translation, Philada., 1889.

[2] Schultze, *Die Pathologie und Therapie der Lageveränderungen der Gebärmutter*, 1881.

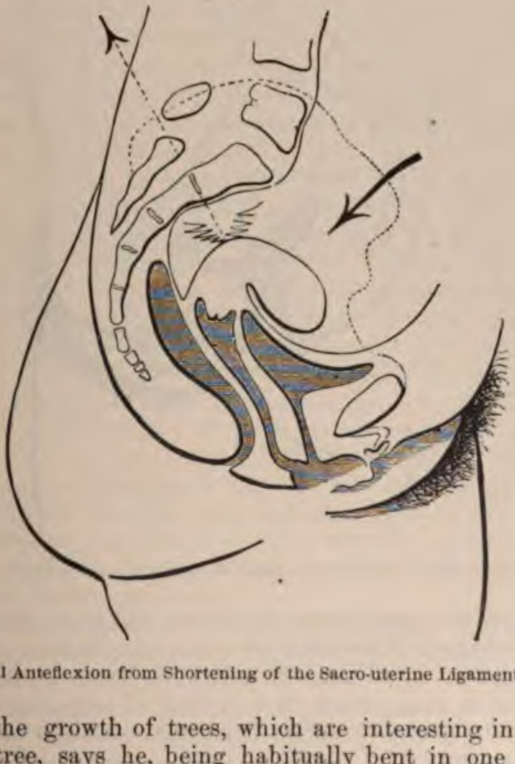
[3] Fritsch, *Lageveränderungen der Gebärmutter*, 1881.

[4] *Op. cit.*, p. 61.

Pathology.—Flexions may be congenital or accidental. As the opposite walls develop, an excess of nutrition may be appropriated by one, which grows rapidly, while the other, developing more slowly, arrests the erection of the uterus, and, giving it an inflexion, creates a concavity on one side and a convexity on the other. If the posterior wall develop most decidedly, an anteflexion results; if, as was the case in 19 out of M. Soudry's 71 autopsies of infants, posterior displacement exist, and the anterior wall receive the chief amount of nutrition, a retroflexion is the consequence. But not only does the excessive growth of one wall create an inflexion on the opposite side; the side which is bent undergoes to a certain extent atrophy, and this increases the already growing disproportion. This, in all probability, is the source of congenital flexion, a condition always exceedingly difficult of cure, but fortunately one which does not create as much corporeal congestion and constitutional disturbance as the more remediable form which is accidental.

In the supplement to the second volume of Herbert Spencer's work upon *Biology* appear some remarks upon the influence of prevailing winds upon the growth of trees, which are interesting in this connection. The tree, says he, being habitually bent in one direction, its nutrition is, on the concave surface, impaired, the ligneous material upon the convex portion is deposited in excess, and in consequence the

FIG. 175.



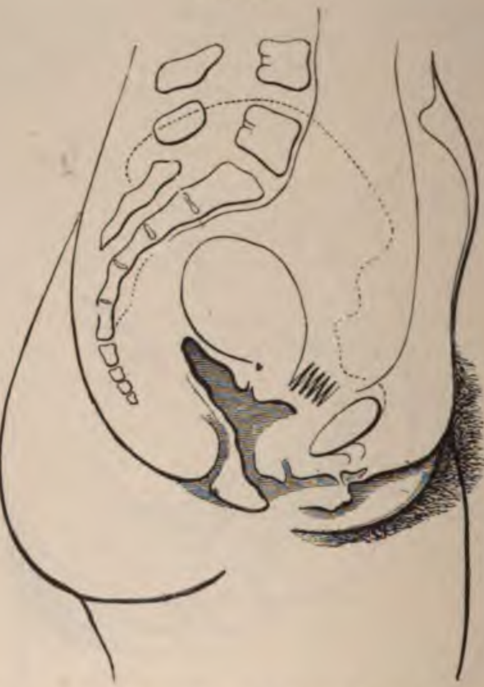
Pathological Anteflexion from Shortening of the Sacro-uterine Ligaments (Schultze).

heart of the tree is not central, but considerably nearer to the concave than to the convex surface. Upon experimenting upon growing twigs by bending them to one or the other side, he found that he could uniformly produce the same result. When the uterus is flexed a similar change will be found to occur from a like cause.

Congenital anteflexion is much more common than congenital retroflexion. Cases of the latter are, however, by no means unknown. Boivin and Dugès[1] report 2 cases, Dubois 1, Deville 1, and Bell 1 in a very young girl. We have several times met with it.

Virchow was one of the first to attribute the formation of flexions to the construction of peritonitic adhesions in front or behind the uterus respectively. B. S. Schultze[2] is the most earnest believer in the dependence of many cases of anteflexion on a shortening (congenital or inflammatory) of the sacro-uterine ligaments, and even gives an illustration of the production of retroflexion by anterior fixation of the cervix. As regards anteflexion, we think he is right in many instances, although we believe that he exaggerates the frequency of preceding inflammatory contraction of the posterior uterine ligaments, especially in virgins without any such history.

FIG. 176.



Retroflexion of the Uterus from Anterior Fixation of the Cervix (Schultze).

Any influence which weakens the tissue constituting the uterine walls creates flexion. If the posterior wall be chiefly affected, the body falls backward; if the anterior, it inclines forward; if both, the direction of inclination is decided by extraneous forces. Rokitansky has proved that such weakening is accomplished by endometritis, which creates an inward growth of the utricular glands into the submucous connective tissue near the os internum, which in consequence undergoes atrophy and enfeeblement; or by cystic degeneration in the cervical glands, "which, from their increased size and subsequent pressure, cause the submucous stratum to become atrophied, and which, ultimately bursting, thereby cause a collapse of tissue in the formerly dense framework of the uterus, leaving in its place a flaccid, netlike areolar tissue incapable of sustaining the organ in its normal position." Both these occurrences, says Klob, take place quite frequently. Rokitansky says that in the anterior semicircle of the uterine tissue around the os internum of women who have borne many children a large transverse vein is found, which, by its removal of tissue, weakens the wall.

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[1] Cusco, *op. cit.*, p. 34.

[2] *Loc. cit.*, 1881.

But there are other influences which may accomplish this result: abscess of the uterine tissue; development of fibroids which disorder the blood-vessels; varicose degeneration of the veins and sponginess of tissue engendered by prolonged traction upon the neck; disturbance of nutrition by flexure created suddenly by a blow or fall, or gradually by traction from false membranes, subinvolution, or areolar hyperplasia, which accomplishes on a large scale the substitution "for the dense framework of the uterus of a flaccid, netlike areolar tissue, incapable of sustaining the organ," which Rokitansky declares occurs at the os internum in cystic degeneration.

This loss of power in one or both walls of the uterus is frequently, though not universally, the cause of flexions of accidental character. They are sometimes due to force sufficiently strong to overcome the resisting power of the uterine tissue, either suddenly or by slow degrees. Once flexed, one wall soon undergoes degeneration, and thus two causes for a continuation of the condition are combined.

The point of greatest weakness is the point at which flexion occurs, and this is usually opposite the os internum. In anteflexion it may occur below this point, when the neck only is flexed, from prolonged and habitual constipation. In both retroflexions and anteflexions we have known it to occur at the middle of the body, and escape superficial examination or induce a belief in the existence of fibrous tumor. Klob has noticed this but once, and has failed to find an analogous instance. Cusco[1] records one case in his own experience where the body was equally divided by a flexion, and quotes Ashwell and Bell for others of similar character.

Formerly it was supposed that the bevelling of the uterine body at a more or less acute angle, either backward or forward, must necessarily interfere with the influx and egress of blood from the upper portion of the organ, and therefore produce at first acute, and in time chronic, congestion of that part, with the resultant hyperplasia of the stoma and catarrh of the mucous lining. Most emphatic in his support of this view of the subject was, and still is, Hewitt, who says: "It is somewhat surprising that the occurrence of mechanical congestion of the body of the uterus, arising from mere change of shape of the organ, as above pointed out, should not have attracted the attention of uterine pathologists." Klob coincides with these views, and adds that "the reflux of blood from the uterine to the hypogastric veins is interrupted (by the flexion), and in consequence of the collateral hyperæmia frequently a very considerable dilatation of the plexus pampiniformis takes place, because the blood can now only flow through the spermatic vein."

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[1] *Op. cit.*, p. 37.

[I myself, since the appearance of Klob's work on *Pathological Anatomy*, published in 1868, had paid special attention to this subject and made it a prominent feature of my lectures.—T. G. T.]

[During the last ten years, as the result of increased observation and experience, a marked change has taken place in my views on the pathology of flexion of the uterus and its significance as a factor in the production of disease of that organ and its appendages. At the present day anteflexion is generally considered to be, in its minor stages, a physiological (even congenital) condition, only productive of evil under accidental complications, and retroflexion is usually looked upon as a sequel to or companion of retroversion, and of no special consequence in itself.—P. F. M.]

At the point of flexion the cervical canal may be more or less closed by apposition of its walls. From this cause the ingress of fluids may be prevented, and sterility may result.

Complete closure of the uterine canal by a flexion can occur only when agglutination of the opposing surfaces has taken place; therefore, retention of blood, serum, mucus, or air in the uterine cavity cannot be caused by simple flexion.

Whether a flexion, even of the highest degree, can prevent the egress of fluids from the uterine cavity seems exceedingly doubtful. Some recent authorities claim that not even pain is produced by the passage of menstrual blood through a flexed uterine canal, and thus deny the occurrence of obstructive dysmenorrhœa. We confess that we do not consider this question as yet quite settled. While some writers will not admit that flexions are either pathological or produce any symptoms whatever, our experience recalls numerous instances in which painful menstruation, existing together with more or less anteflexion, was entirely relieved by a dilatation of the uterine canal, and others where sterility, for which no other cause than anteflexion could be found, was followed by conception after the canal was dilated and kept straight for some time by a stem pessary. Of course it does not necessarily follow that *post hoc* in these cases means *propter hoc*; still, the inference is natural and by no means impossible. [On this point my views and those of Dr. Thomas do not quite agree, he still believing in the positive obstructive power of a sharp anteflexion.—P. F. M.]

Some writers claim that menstrual congestion straightens the uterus and facilitates the escape of the menstrual blood. Our opinion is rather that a flexion which in the intermenstrual period offers no angle of obstruction becomes an obstacle to the exit of menstrual blood in consequence of the enormous increase in diameter of the mucous membrane at that time. This view explains why the pain disappears after the blood has begun to escape, for then the temporary congestion is relieved, the mucosa shrinks, and the obstruction is effaced for the time being.

In congenital flexion the circulation of the uterus is so gradually interfered with that marked congestion is not so likely to occur as it is when the organ is suddenly bent upon itself, nor is occlusion of the cervix ordinarily so complete.

Results and Complications.—In place of the long list of pathological consequences formerly attributed to flexion of the uterus, the observations of recent years compel us to substitute two conditions only which may without exaggeration be held to depend on the aggravated varieties of this deformity—viz. dysmenorrhœa and sterility.

Many gynecologists of the present day deny that flexion produces even these two results. But, as we have already stated, our own experience leads us to accept them, mainly for the reason that, no other apparent cause for the painful menstruation or sterility being present, the dilatation and straightening of the organ have in our hands so commonly resulted in a relief or cure of both conditions that we have been forced to assume that the symptoms depended on the flexion. We admit, however, that dilatation of the uterine canal may overcome a neuralgic or spasmodic contraction of the internal os, and thus relieve the dysmenorrhœa, or that the better drainage of the cavity brought about by this same treatment may open the way for conception. Neither will we deny that if uterine congestion happens to exist with a flexion, the congestion may cause the dysmenorrhœa.

Etiology of Uterine Displacements.—Both in didactic and clinical teaching we have for many years grouped the causes of uterine displacement in the manner about to be described. Enlarged experience with the method leads us to regard it with increased favor, and we would urge its claims to adoption by teachers and students. By it no influence producing displacement escapes classification, and it induces him who employs it to arrange the subject systematically in his mind.

The general causes of uterine displacement may thus be tabulated:

1st. Any influence which increases the weight of the uterus;
2d. Any influence which enfeebles the supports of the uterus;
3d. Any influence which displaces the uterus by pressure;
4th. Any influence which displaces the uterus by traction.

To state this more fully in other words—

1st. The uterine supports are equal to sustaining the organ when of normal weight; but when its weight is increased they naturally fail in their task.

2d. Even if the uterus be no heavier than it should be, it may become displaced from depreciation of that support to which it is entitled and which was made to sustain it.

3d. If both the uterus and its sustaining powers be perfectly normal, it is evident that direct or powerful pressure may overcome the latter and force the organ from its place.

4th. It is equally evident that, as by a tenaculum fastened in the uterus of the cadaver we may drag it from its position, so may contracting adhesions following pelvic inflammation or a prolapsed vagina effect this in a living body.

All these facts having been premised, a concise view of the special causes of displacements may be thus presented.

1. *Influences increasing weight of uterus:*
    - Congestion;
    - Tumors in the walls or cavity;
    - Pregnancy;
    - Excessive growth of any of its component parts;
    - Subinvolution.
2. *Influences weakening uterine supports:*
    - Rupture of the perineum and posterior vaginal wall;
    - Weakening of vaginal walls from subinvolution or over-distension;
    - Stretching of uterine ligaments;
    - Relaxation of pelvic fascia;
    - Abnormally large pelvis;
    - Any influence impairing sustaining power of abdomen.
3. *Influences pressing the uterus out of place:*
    - Tight clothing;
    - Heavy clothing supported on the abdomen;
    - Muscular efforts;
    - Abdominal tumors;
    - Pelvic inflammatory exudations;
    - Repletion of the bladder and rectum;
4. *Influences exerting traction on the uterus:*
    - Contracting adhesions following pelvic inflammation, either cellular or intra-peritoneal;
    - Cicatrices in vaginal walls;
    - Shortening of uterine ligaments;
    - Natural shortness of vagina and uterine ligaments;
    - Prolapse of vagina, bladder, or rectum.

The mode of action of each of these causes is so evident as to require no special mention at this time, but it will be particularly alluded to hereafter.

No circumstance combines so many of these causes of displacement as utero-gestation and parturition. Should involution follow these without interruption, no tendency to displacement results. But the process of involution is frequently interfered with. Then, as consequences of the arrest of retrograde metamorphosis, the uterus remains large and heavy, the vagina voluminous and feeble, and the uterine ligaments, which owe their strength chiefly to the uterine muscular tissue which they contain, lax and weak. As a result of parturition, too, the perineum is often enfeebled, which allows of prolapse of the vagina, which produces traction upon the uterus.

These remarks apply to true displacements of the uterus. To flexions or deformities of the organ itself they do not so sufficiently apply as to render uncalled for some special remarks, which we now proceed to offer.

Predisposing Causes of Uterine Flexions.—Any cause which predisposes to enfeeblement of uterine tone, to the development of a force which overcomes this even when unimpaired, or, still more, one which combines the two evil influences, prepares the way for flexure of the uterus under the impulse given by a sudden or persistent exciting cause. They may be thus enumerated:

Parturition;
Impoverishment of the blood;
Extreme youth or age;
Laborious occupation;
Relaxation of abdominal walls;
Influences altering pelvic axes.

Exciting Causes.—One of the functions of the cervix uteri is to support the body, and for the performance of this it is abundantly competent unless its powers be impaired by one of the following influences:

Influences weakening uterine support:
  Endometritis;
  Pregnancy;
  Subinvolution;
  Areolar hyperplasia.

Influences increasing the weight of the fundus:
  Enlargement of the body from subinvolution or hyperplasia;
  Pregnancy;
  Tumors.

Influences pushing the fundus or cervix forward or backward:
  Abdominal or pelvic tumors;
  Ascites;
  Fecal accumulation;
  Tight clothing;
  Muscular efforts.

Influences exerting traction forward or backward:
  False membranes from pelvic peritonitis.

Of the first class of causes, inflammation affecting the mucous membrane of the neck and creating areolar hyperplasia in the parenchyma is, according to my experience, one of the most frequent. The hyperplasia thus arising results in atrophy of the muscular and submucous fibrous structures of the uterus and their replacement by hypertrophied areolar tissue, and produces a marked tendency to this deviation by thus substituting a lax and feeble for a dense and powerful substance. Klob declares that this replacement of strong tissue by that which is weaker occurs more especially near the os internum. Virchow denies the agency of this condition as a causative influence, as he likewise does that of fatty degeneration, observed by Scanzoni, at the point of flexure. The influence of parturition, abortion, and pregnancy has been admitted by all authorities.

The varieties coming under the head of the second set of causes are all universally admitted, as are also those belonging to the third. Fecal impaction may possibly produce flexion of the body, and frequently causes the cervix to bend sharply forward. The fourth set of causes is put beyond question by the fact that in autopsies the uterus is often found thus bound in a state of flexion.

The etiology of cervical flexion is somewhat different from that of corporeal. It is, we feel satisfied, generally induced by pressure directly exerted upon the uterus by tight clothing, which forces it against the concave surface of the vagina. This surface gives the impinging part a slant forward and keeps it thus bent. Habitual constipation increases this vicious curve, and the two causes combined often result in this unmanageable form of the affection. This explains the fact, which all must have noticed, that in pure corporeal flexion the uterus is often high up in the pelvis, while in that of cervical form it is almost invariably low down. It likewise explains what our observation leads us to regard as a fact, that in nulliparous women the cervical and cervico-corporeal varieties preponderate in frequency over the corporeal form, which is generally met with in multiparous women.

There is still another pathological element which enters into the etiology of cervical flexions, and explains the phenomena with regard to them which we have just mentioned. The uterus being forced downward by influences exerting themselves upon the abdomen, if the utero-vesical ligaments be lax and yielding corporeal flexion will occur, the cervix retreating under pressure. If, however, these ligaments keep the cervix in close contact with the bladder, cervico-corporeal or pure cervical flexion will be developed. Parturition does more to stretch these ligaments than anything else, and thus cervical flexion is not so generally met with in women who have gone through that process as in those who have not. Corporeal flexion is the variety seen after parturition; the cervical and cervico-corporeal forms those which we see in nulliparous women. Not only is this fact interesting in reference to pathology; it has an important bearing upon the treatment of cervical flexions. He who would treat these cases successfully must systematically stretch the ligaments which keep the cervix in an anterior position, and by this means strive to change the form of displacement to that of corporeal flexion or of anteversion.

Retroflexion is most frequently the result of some influence which weakens the tone of the uterine walls, but even when this is normal any force directly applied may displace it and produce a flexure, whether such force is developed suddenly or gradually.

We have now pursued the study of flexions, as a whole, as far as it is profitable to do so, and from this point they shall be considered under separate heads.

The uterus may be flexed upon itself anteriorly, posteriorly, or laterally, giving rise to the disorders known as—

Anteflexion;
Retroflexion;
Latero-flexion.

The fundus in falling forward or backward does not always preserve the median line, but commonly falls obliquely to the right or left. This obliquity is frequently created, even where the median line was originally preserved, by the use of a pessary, and constitutes so prominent a difficulty in these cases that we employ a special instrument for its treatment.

Thus we may find a uterus flexed forward and laterally, backward and laterally, or the whole organ may be tilted backward, while its body is anteflexed.

These varieties are known as—

Ante-latero-flexion;
Retro-latero-flexion;
Retroposition and anteflexion;

with minor varieties of the same displacements.

This is all that need be said upon the subject of uterine displacements in general. We shall now proceed to complete the outline here sketched and go into the details connected with each variety of the affection.

CHAPTER XXVIII.

ASCENT AND DESCENT OF THE UTERUS.

Ascent of the Uterus.

In its normal condition the uterus descends into the pelvic cavity so that its neck assumes a position about two inches from the vulva. If its weight be augmented, it comes much lower than this, and continues to do so as its volume increases until its development becomes so great that it cannot be accommodated by the pelvis. Then it escapes from the cavity by ascending to a more capacious space above the superior strait. This change occurs in every normal pregnancy. During the first three months the uterus falls in the pelvis, being in a state of prolapse. As the fourth month approaches its volume becomes so great that it can no longer be retained in the pelvic cavity, and then it escapes above the superior strait, where sufficient space is afforded for it to undergo full development. This is not only so in pregnancy; the uterus is similarly affected by morbid growths. When, under these circumstances, it leaves the pelvis, the fact is expressed by the term ascent.

Accordingly as the pelvic tumor develops in one or the other part of the pelvic cavity the uterus is pushed upward in the opposite direction. Thus ovarian tumors, which are mostly situated behind the uterus, cause that organ to ascend anteriorly so long as they are still contained in the pelvic cavity; and the same applies to fibroid growths springing from the posterior wall of the uterus, or to malignant masses developing in the retroperitoneal cellular tissue. Besides the ante-, retro-, or lateral elevation of the uterus, there is often more or less twisting or torsion of the organ.

Ascent of the uterus is never an original disease, but the result of some important change connected with that organ, and requires merely a mention. It may occur whenever a tumor is developed in connection with the vagina, rectum, or recto-vaginal cul-de-sac, when there exists a growth in the walls or cavity of the uterus which renders it too large for accommodation in the pelvis, or when an abdominal tumor draws up the uterus. It never requires treatment, and is of importance only as exciting suspicion of pregnancy or as an evidence of morbid growth in some way connected with the organs of generation.

Descent or Prolapsus of the Uterus.

Definition, Synonyms, and Frequency.—The name of this disorder defines its character with sufficient clearness. It is of frequent occurrence, and undér the name of falling of the womb is well known to women, and constitutes for them an object of especial dread. As almost all women, after the period of fruitfulness has passed, have an intuitive fear of cancer of the uterus, so do a large number before that time manifest an apprehension of prolapsus. In the one case the anxiety is for life, in the other for usefulness and comfort.

Unfortunately for the student of this subject, its nomenclature has been rendered somewhat obscure. By some all cases of prolapsus in which the uterus does not escape from the vagina are termed incomplete, while those in which it does are styled complete. By others complete protrusion is denominated procidentia; and by others still a very slight descent without alteration of direction of axis has been designated by the very old name of "squatting uterus." We have striven to simplify the matter by applying the name prolapsus to all, and marking the degrees of descent by the terms "first," "second," and "third."

Anatomy.—Those uterine supports which are especially active in preventing uterine descent are the surrounding areolar tissue, which binds it to the bladder, the rectum, and the pelvic walls; the utero-vesical and utero-sacral ligaments; and the retentive power of the abdomen. About the sustaining influence of the vagina there is much difference of opinion; our opinion formerly was that the promontory formed by the vagina in front of the cervix effected something in the way of support, but observation has led us to modify very much the belief which we once had in the general sustaining influence of the canal. Loss of tone in it, resulting in prolapsus vaginæ, is commonly attended by a similar prolapse in the uterus, but it does not follow that the uterus falls from want of support; it is more probably dragged down by the heavy vagina. This view may be sustained by so many strong arguments that it need not invoke weak ones. A good deal of stress has been laid upon an experiment for which Aran credits Stoltz, that of cutting the vagina away without noting any descent of the uterus. A little reflection must show that this proves almost nothing. It merely demonstrates the fact that without the vagina other supports are sufficient to sustain the uterus. No one has ever maintained that the vagina was the only support which keeps the uterus up, nor that others were insufficient without it.

A great deal of support is unquestionably derived from the connective areolar tissue, which so closely unites the uterus with the rectum, bladder, and pelvic walls as to involve displacement of these viscera in its descent. Dr. Savage, dragging the uterus of a cadaver forcibly downward by means of a vulsellum attached to the neck, found that after cutting its important ligaments and overcoming by force the action of the vagina it still would not advance. "The obstruction was found to be due to the subperitoneal pelvic cellular tissue, particularly where it surrounds and accompanies the uterine blood-vessels."

The most important factors in the prevention of prolapse are the utero-sacral ligaments, which Aran considered the only real ligaments of the uterus. Arising from the point of junction of neck and body, they usually embrace the rectum in their bifurcation posteriorly, and, diverging on each side of it, terminate in the subperitoneal cellular tissue as high up as the second lumbar vertebra. They are exceptionally inserted into the rectum. It was the recognition of this anatomical arrangement of these important ligaments which led Huguier to suggest that they be called utero-lumbar instead of utero-sacral. They consist of the following elements: peritoneum, pelvic connective tissue, uterine cortex, and vaginal muscular fibre. Their influence, as likewise to a much less degree that of two similar bands connecting the cervix in front with the bladder, cannot be doubted.

These are probably all the factors which unite in the prevention of prolapsus in the first and second degrees. When they are entirely overcome and the descent has become complete, the round and broad or lateral ligaments come into action, but not until that has occurred.

Varieties.—This displacement may occur very suddenly and unexpectedly, or gradually and by successive steps. As the symptoms of the two varieties differ only in the rapidity and severity of their development, and the second is much the more frequent, we shall direct our remarks chiefly to it, and describe the first in a few words in an appropriate place.

FIG. 177.

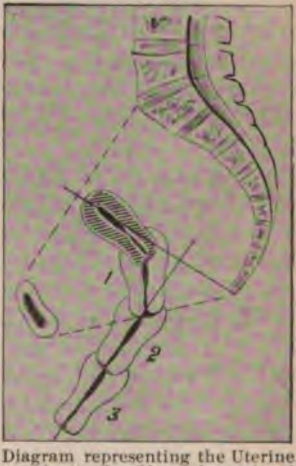


Diagram representing the Uterine Axis in the Three Degrees of Prolapsus.

Prolapsus may exist either in the first, second, or third degree, the direction of the uterine axis in each of which is exhibited in Fig. 177.

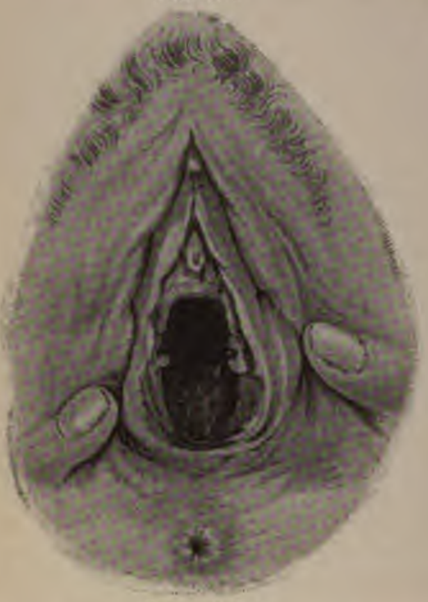
In the first the uterine axis is bent forward, the organ being somewhat anteverted and sunk in the pelvis. In the second the body has gone toward the sacrum, the cervix having come down to the ostium vaginæ. In the third the last barrier has been overcome, and either a part or the whole of the uterus hangs between the thighs.

Causes.—The causes which predispose to this accident are—

Child-bearing;
Laborious occupations;
Advanced age;
Habitual constipation.

We know of no way in which we can give so concise a summary of the exciting causes of prolapsus as by a reference to the classification to which we have already referred under general considerations upon displacements; for the exciting causes will be found to belong in every case to one of four classes: those increasing uterine weight; those enfeebling uterine supports; those forcing the uterus down by power applied above; and those drawing it down by traction from below.

FIG. 178.



Parous Vulva.

Showing gaping of vaginal orifice and consequent inclination to descent of vaginal walls. (Compare with cuts of virgin and nulliparous vulvæ on pp. 123, 124.)

a. Examples of causes connected with increased uterine weight:

Tumors, submucous, subserous, or mural;
Pregnancy (rare, but sometimes met with);
Hypertrophy or hyperplasia;
Retained fluid (rare).

b. Examples of causes connected with enfeeblement of uterine supports:

Abnormally capacious pelvis;
Destruction of power of the perineum;
Loss of tone of vaginal walls;
Loss of tone of uterine ligaments;
Absorption of fat from pelvic areolar tissue;
Atony of abdominal muscles;
Diminution of power of respiratory muscles.

c. Examples of influences forcing the uterus downward:

Violent coughing; tumors in abdomen;
Ascites; violent muscular efforts;
Tight and heavy clothing;
Straining at stool.

d. Examples of influences dragging the uterus down:

Congenital or acquired shortness of the vagina;
Prolapse of vagina, bladder, or rectum.

We have already stated that these evil influences are most completely combined in the condition existing after parturition, when the uterus is heavier than normal, the recently-distended vagina relaxed and feeble, the uterine ligaments very much stretched, and the sphincteric muscles of the vagina weakened. When, as so often happens, rupture of the perineum and of the cervix uteri occurs, and is followed by subinvolution of vagina, uterus, and uterine ligaments, we have in perfection all the conditions which give rise to this displacement. Of all the causes of prolapsus this combination is the most frequent, and hence the difficulties attending cure. It is for this reason that prolapse is found to be rare in women who have never borne children, less rare in those who have borne one only, and appears to increase in frequency in proportion to the frequency of the parturient process. Scanzoni reports that in

114 cases of prolapsus, 99 occurred in women who had borne children. Winckel[1] says that of 349 women with prolapsus, 22.5 per cent. were between twenty and thirty years of age, 22 per cent. from thirty to forty, and 25.2 per cent. from forty to fifty. Of these 26 per cent. had borne one child, 52 per cent. one to five children, and 22 per cent. from five to ten. Even the most complete prolapse, however, will sometimes be met with in young and unmarried women. Within the past few years we have met with 7 such cases, 3 in virgins of seventeen, nineteen, and twenty-four, 3 in old maids between fifty and sixty, and 1 in a healthy laboring woman at the menopause.

Next in order of frequency will be found a condition which occurs in old women—a loss of vaginal power from atrophy of the vagina and absorption of the padding of fat which normally occupies parts of the pelvis and helps to aid that canal in sustaining the uterus. This condition has been specially mentioned by some of the German pathologists, and attention has been called to its importance by Dr. Barnes of London. Here, although the uterus is atrophied, it descends in spite of its lightness, partly from loss of support from the vaginal promontory and partly from traction exerted upon it by the prolapsing vaginal walls.

An important position as a pathological factor is assumed by loss of the retentive power of the abdomen. Want of exercise except in walking induces in women very commonly an atonic condition of the thoracic and abdominal muscles, and the respiratory act therefore becomes inefficient and the piston function of the diaphragm feeble and imperfect. As a consequence of this failure the uterus rises in the pelvis at each expiration less perfectly than it ought; its circulation, lacking the stimulus of the abdominal rise and fall, becomes sluggish; gradually it settles lower and lower in the pelvis, and becomes a readier prey to the action of other malign influences.

Relaxation of the abdominal walls probably also favors displacement by effecting an alteration of the direction of pressure transmitted to the uterus, bladder, and superior vaginal wall, and by permitting the free entrance of intestines into the anterior peritoneal prolongation or anterior uterine excavation.

Increased uterine weight and pressure from above are so plainly active in creating prolapsus that no one will doubt their causative influence. By its instrumentality we see complete prolapsus occur, with ovarian tumors, ascites, etc.

Pathology.—There formerly was no variety of displacement about the pathology and mechanism of which gynecologists were more at variance than this, and yet none to which a greater amount of honest scientific labor has been applied for the elucidation of these very points. As examples we may cite the experimental researches of Aran,[2] Legendre,[3] Huguier,[4] Savage,[5] and Taylor,[6] to which the seeker after more elaborate data is referred.

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[1] *Loc. cit.*, 1889, p. 261.

[2] "Études anatomiques et Anatomo-pathologiques sur la Statique de l'Utérus," Paris, 1858, *Archiv. Gén. de Méd.*

[3] *De la Chute de l'Utérus*, Paris, 1860.

[4] *Les Allongements hypertrophiques du Col de l'Utérus*, Paris, 1859.

[5] *Female Pelvic Organs*, London, 2d ed., 1870.

[6] *On Amputation of the Cervix Uteri, etc.*, New York, 1869.

Our limited space will not permit us to go fully into the views of these investigators, and we shall confine ourselves chiefly to a rather dogmatic statement of our own opinions, at the same time acknowledging that they are, in great extent, founded upon the investigations alluded to.

At the present day we may fairly say that the manner in which prolapsus of the uterus is accomplished is well understood, and no longer a matter of doubt or discussion. In order to explain to the student, however, the train of investigation and reasoning by which this result has been achieved, we shall retain the remarks on this subject found in our last edition.

It matters not whether the original cause of the displacement be increase of uterine weight, depreciation of sustaining power, or direct force exerted upon the organ from above or below; an invariable result of its existence is diminution of the power of the uterine supports. The ligaments are stretched, the vagina distended and doubled upon itself or everted, and the contractile power of the sphincteric muscles impaired. The displaced organ is generally affected by congestion and inflammation of the mucous lining, its cavity is much enlarged, and solutions of continuity occur upon the cervix. The vaginal rugæ are effaced, and the lining of the canal, exposed to atmospheric influences and friction, looks like the cicatrized surface of scalded skin rather than mucous membrane.

"The tension of the aponeurotic fibres of the broad ligaments," says Legendre, "during uterine prolapse results in compression of the hypogastric veins, as compression of the veins of the neck occurs from tension of the cervical fascia when the head is forcibly thrown backward. In this way congestion of the uterus and other pelvic organs is kept up." Prolapsus, from its influence in thus producing hyperæmia, is usually attended by hyperplasia of the areolar tissue of the uterus. This organ undergoes an absolute increase in size, and the tissue of the cervix is especially altered. Simultaneously with hyperplasia there are varicose degeneration of the blood-vessels of the cervix and absorption of its proper tissue. This increases the natural ductility of the part, and upon any traction being applied it stretches so as to produce the phenomena of variation in the length of the uterus mentioned under the head of Physical Signs. The walls of the vagina are found much thickened by proliferation of epithelium and hypertrophy of the submucous layers of areolar tissue. Thus it becomes not only more capacious, but heavier and more voluminous, than normal, and even if its increase in volume and weight is a consequence of uterine displacement, it drags upon the uterus and increases its tendency to descend.

The uterus may descend from its normal place in the pelvis under any one of the four influences which have been mentioned. It must not, however, be supposed that one only is usually active. On the contrary, two, three, and even four, are often combined in furthering the result. For thoroughness of study they are examined apart, that course being also chosen from the fact that even if several causes are combined, one is usually especially prominent as a factor.

If a careful clinical study be made of this interesting subject the uterus will be found to descend in one of these ways:

1st. A woman who had previously been in good health begins to complain of dragging about the loins, backache, and sense of fatigue about the pelvis. An examination is made, and the uterus is found resting upon the floor of the pelvis, its axis little altered. There is no rupture of perineum, no redundancy of vagina, and the habits of life of the patient preclude the possibility of muscular efforts or tight clothing being agents in the condition. A careful examination of the displaced uterus shows it to be large and heavy from subinvolution, or discovers a fibrous tumor in its structure. The natural supports have been perfect, but they have been overtaxed and have yielded. Increased uterine weight is the prime mover in the disorder.

But keep this case under observation. The descent already effected has drawn down the bladder, caused pressure upon the rectum, established a hyperæmia in the tissues of the vagina, and begun already to rob the uterine ligaments of their power by stretching them. Pressure on the rectum and dragging upon the bladder create irritation, the patient "bears down" in evacuating these viscera, and a new influence is developed—force from above. Very soon congestion of the vagina results in excessive areolar growth, this canal falls into its own distended channel, and another evil influence is the result—traction upon the uterus from below. The uterus has now descended, so that its os projects between the labia majora; if its ligaments were stretched before, how much more so must they be now!

2d. A uterus is found in the first degree of prolapsus. It is a healthy uterus, normal in size, weight, and consistency. Its supports appear perfect, and no influence exerts traction upon it from below. Everything is normal but one—the uterus has descended. Examination proves that this woman has labored hard, lifting heavy weights, and placing herself in a constrained attitude to do so; or she has for weeks suffered from a spasmodic, violent cough or from obstinate constipation, which has caused tenesmus. The cause of the prolapse is evidently force applied to the uterus from above. But this remains the sole cause for a short time only. Very soon increased weight of the uterus from congestion, enfeeblement of uterine supports from prolonged tension, and traction by falling of the hypertrophied vagina and prolapsed bladder complete the vicious circle.

3d. An examination of the uterus in a case exactly similar as to symptoms demonstrates no increase of uterine weight, no force applied from above. The woman is found to have a justo-major pelvis, which has always resulted in precipitate labors; or she is past sixty and a senile atrophy is developing; or the perineum is ruptured, and the anterior and posterior vaginal walls are protruding in egg-like pouches at the vulva, not sufficiently to drag upon the uterus, but enough to shorten the vagina by allowing its distal end to protrude; and thus the vaginal promontory is removed. The mischievous factor is loss of uterine support. The uterus is normal in weight and exposed to no evil influences from pressure or traction, but its feeble supports even then are unfit for their functions, and the uterus falls. It descends to the second degree, and, dragging upon the broad ligaments, their aponeurotic expansions compress the hypogastric veins, great congestion results, and at once a new influence develops—increased uterine weight. Now rectal and vesical tenesmus and pressure by the displaced abdominal viscera add another untoward element—force applied from above. And as the descending uterus everts still further the congested, voluminous, and heavy vagina, it drags the offending organ still more rapidly down.

4th. The reader, wearied by repetition, may crave a respite here, but he asks it just where it cannot be granted, for we come to the consideration of the most frequent and consequently most important of all the influences resulting in prolapsus uteri. Prolapse of the uterus is sometimes a primary affection, but in the great majority of cases it is secondary, produced by prolapse of the vagina, which literally drags it from its position. There are two methods in which this occurs: 1st. The perineum is ruptured, and by this the vaginal walls lose the buttress against which they rest, and the power of the pubo-coccygeus muscle is diminished. 2d. A vagina developed by utero-gestation does not undergo involution, but remains a large, voluminous, and heavy bag, the redundant walls of which overcome the resistance of the perineal body and prolapse, dragging the uterus down, either before or simultaneously with their escape from the vulva.

Dr. Duncan, in an essay read before the Edinburgh Obstetrical Society[1] in 1871, maintained that the perineum had nothing to do with the support of the uterus, and that therefore laceration of this part is not a cause of prolapsus. We do not believe that the perineum supports the uterus directly, nor that upon the cadaver its section would result in prolapsus; but we believe that destruction of the perineal body, which acts as a support to the vagina, results in loss of support to both its posterior and anterior walls. These prolapse, their tissue becomes hypertrophied, and they drag down the bladder and then the uterus. Look at Fig. 57, and see how much support vagina and bladder obtain from the perineal body, and the results of its rupture may be better appreciated. So long as the vagina is normal in volume and weight, and remains within the pelvis with its walls in apposition, it constitutes, by its ante-cervical projection, we think, a uterine support. So soon as it falls from the pelvic cavity, becomes hypertrophied, and has its walls separated, it not only loses this power, but degenerates into a uterine tractor.

The same authority points to the fact that many cases of complete perineal laceration do not produce prolapsus uteri. This is true. Such laceration is usually the result of parturition, and is, we are satisfied, often a cause of subinvolution of the vagina. If this condition has resulted, the laceration is very generally followed by prolapsus vaginæ, and thus by descent of the uterus. If vaginal involution have not been interfered with, it is usually not so.

Aran points out the fact that removal of the vagina from the cadaver does not produce uterine prolapse, and Dr. Duncan declares, "I have no doubt that if, by way of experiment, the perineum was cut through in a healthy woman, no tendency to prolapsus would be thereby produced." We freely accept both experiment and proposition, but we cannot agree in the deductions based upon them. When the uterine ligaments are strong, the uterus does not readily leave its position. Sometimes traction steadily exerted upon the cervix fails to draw down the body, but stretches the neck, so that the uterus measures by the sound between six and seven inches. In many cases, before prolapse occurs, the uterus is affected by areolar hyperplasia or the local atrophic state engendered by flexion, which last Dr. Hewitt regards as a frequent source of it, and when thus weakened it readily yields to traction. When the tractile force is checked by reposition of the uterus the neck instantly contracts, and the length of the whole organ greatly diminishes.

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[1] *Transactions*, vol. ii. p. 269.

May this fact not explain the experience of Huguier, who found only 2 cases of true prolapse in 60 reported cases, and of Routh, who in a large experience met with only 3? It seems to us highly probable that these investigators, making their measurements while the uterus was prolapsed to the third degree, concluded that hypertrophic elongation of the supravaginal portion existed, when in reality this peculiarly elastic tissue, which was the consequence and not the cause of the descent, was the true pathological condition. Certainly some such explanation must account for the remarkable discrepancy which exists between the results of these two eminent gynecologists and the great majority, whose experience is opposed to theirs.

In these cases the force of traction appears to expend itself upon the most powerful uterine ligaments, those inserted at the axis of rotation, the cervico-corporeal junction. They yield, and the cervix advances toward the vulva, but the uterus, supported though it is by factors of less power, resists steady traction, and remains in place. Legendre attached to the cervix uteri of a cadaver a weight of fifteen kilogrammes, which was gradually increased to fifty during the period of an hour, then diminished to thirty, and kept up traction by that for two hours. At the commencement the uterine canal measured by the sound five centimetres, and at its conclusion nine, the lengthening being chiefly in the cervix. In other experiments a less weight kept in action for several days caused complete prolapse with elongation of the cervix uteri.

Since the appearance of Huguier's essay upon supra- and infravaginal elongation of the cervix as conditions commonly mistaken for prolapsus, writers have commonly considered hypertrophic elongation of the cervix below the vaginal junction under this head. We shall not do so, because the propriety of such a course seems to us to be sustained neither by clinical observation nor pathological investigation, and because true cervical hypertrophy will be elsewhere treated of.

That there is a form of hypertrophic elongation of the cervix uteri which occurs below the cervico-vaginal junction, and appears upon very superficial examination to resemble prolapsus, or even produces that conditioned by traction, we of course admit. But it appears to us erroneous to regard supravaginal elongation—which is marked by an attenuation of the tissues of the neck and "a spongy softness," according to Klob attributable to a "varicose condition of the blood-vessels and absorption of the cervical tissues"—as true hypertrophy.

It is highly probable that this condition, the result of traction, may occur during pregnancy and exist as a source of great annoyance after it. This elongation of the uterine neck is so commonly found in prolapsus uteri, if the disease has existed for some time, as to be demonstrable with as much certainty as the almost invariable simultaneous backward displacement of the body of the organ. With the uterus prolapsed and retroverted the sound will enter from five to seven inches. After replacement of the organ its cavity measures only three to four inches. Emmet has compared this peculiar tractility to the drawing out and reposition of a column of putty.

Course, Duration, and Termination.—Prolapsus uteri is unlimited in its duration, and, unless relieved by art, will continue indefinitely. It impairs the patient's comfort and capacity for exertion, but rarely has a fatal termination, unless by exciting peritoneal inflammation or pelvic cellulitis, as we have seen it do in several cases. Even in the chronic form of the disease death has in very rare cases occurred from uræmia, the result of interference with the ureters. The trigone of the bladder becoming displaced to such an extent that the orifices of the ureters are pressed firmly against the symphysis pubis by the mass behind it, they become obstructed and distended, and in time hydronephrosis may result. Virchow[1] and Kiwisch[2] both announce this fact. An interesting instance of death thus produced may be found in the twelfth volume of the *Transactions of the London Obstetrical Society*, reported by Dr. Phillips. [In a case of incarcerated uterus occurring in my own experience, and which will receive further mention elsewhere in this article, I was compelled to resort to a degree of force in returning the displaced organ which at the time of application I regarded as attended by extreme danger. Had my efforts not succeeded, death would, I feel sure, have resulted, for the uterus and surrounding parts appeared to be about passing into a state of gangrene. This case before I saw it had resisted all the efforts which were applied by three competent physicians. After forcible replacement the entire lining membrane of the vagina sloughed, and the patient narrowly escaped death from peritonitis, which was excited and ran a violent course. Forcible taxis was resorted to, with a conviction on the part of the attending physicians and myself that the issue involved either restitution of the uterus or death.—T. G. T.]

Symptoms.—The symptoms of prolapsus are dependent upon two results growing out of the displacement: the mechanical interference of the womb with surrounding parts, and alteration induced in its circulation and tissue by reason of its abnormal position. The uterus may remain even in the third degree of descent without any marked symptoms, but generally congestion, areolar hyperplasia, and granular degeneration occur, which render it sensitive and intolerant of pressure or friction. At the same time, by dragging up the bladder, rectum, and all the pelvic areolar tissue and fasciæ, and by protruding between the labia, it produces discomfort and often impedes locomotion to a great extent. The most prominent of the symptoms thus created are the following:

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[1] *Trans. Obstet. Soc. of Berlin*, 1847.

[2] *Clinical Lectures.*

Sensation of dragging and weight in the pelvis;
Rectal and vesical irritation;
Pain in back and loins;
Great fatigue from walking;
Inability to lift weights;
Leucorrhœa and other signs of congestion.

It is a very singular and striking fact that in prolapsus, even of the third degree, there is very commonly no menstrual disorder, and equally remarkable that sterility does not ordinarily exist. These immunities are probably dependent upon the facts that the uterine catarrh which usually exists is rather the result of a passive congestion of the endometrium than of true inflammation, and that the axis of the organ, although altered in direction, is not so bent upon itself that an obstruction in it is created.

Physical Signs.—All the symptoms detailed will only excite suspicion and prompt an examination which will fully elucidate the case. Should the affection exist only in the first degree, the finger passed up the vagina will meet with the os low down in the pelvis and pressing upon its floor. As it is slid upward in front of the cervix and along the base of the bladder the resisting anterior wall of the uterus will be clearly distinguished, and it may be found that anteversion or anteflexion exists, complicating prolapsus.

If the second degree have been reached, the os will be found at the ostium vaginæ, prevented from escaping only by the resistance of the sphincteric muscles, and the body, instead of lying forward, will be to some extent retroverted. To determine the degree of prolapsus, more especially in this stage, the patient should be examined standing.

Sight and touch will combine in making a diagnosis in the third degree of prolapse rapid and easy, but even here we have known very grievous mistakes committed. The apparent ease of the diagnosis sometimes causes error by inducing neglect of that caution and watchfulness which in the simplest cases of disease constitute the only safeguard of the physician.

The curious elongation and retraction of the uterus so commonly found in prolapsus of advanced degree and long standing has already been referred to under Pathology.

Differentiation.—In any of its varieties prolapsus uteri may be confounded with fibrous polypus, inversion of the uterus, and hypertrophic elongation of the neck, from all of which, however, it is readily distinguished if the practitioner be awake to the possibility of error. From the first it is known by the presence of the os and cervix and the general shape of the mass; from the second by the presence of the os and cervix and absence of the signs of inversion. The third will readily be recognized by the great length of the cervix, the impossibility of replacing the supposed prolapsed organ, and the great depth of the uterus discovered by the uterine probe after it has been restored to the pelvis.

Prognosis.—In most cases a great deal of relief can be effected by medical and minor surgical means. In a few, in which the displacement is secondary to the existence of a large abdominal or perhaps uterine tumor, nothing can be done either for relief or cure. In many in which descent of the uterus is secondary, due to traction upon it by the prolapsed vagina, bladder, and rectum, cure can be effected, even where the third degree has been reached, by surgical procedures appropriate to the cure of the primary displacements which produce traction upon the uterus.

In cases existing only in the first and even the second degree cure may, in favorable cases, be accomplished by mere removal of the causes which are gradually depressing the uterus.

Complications.—Prolapsus of the uterus in its first and second degrees, and still more frequently in its third, produces the following complications:

Hypertrophic elongation of the cervix;
Ulceration of cervix and vagina;
Eversion of lips of cervix;
Cystocele;
Rectocele.

The general hyperæmia of the uterus, the endometritis, the subinvolution and consequent hyperplasia, which were formerly attributed to the prolapsus, are now more correctly understood as preceding it, and as to a certain extent its causes.

Replace the uterus and keep it in its normal position for a sufficient length of time, and Nature herself will, to a great degree, cure these pathological conditions. This statement by no means invalidates the production of œdema of the prolapsed uterus and vagina by constriction at the vulvar orifice, nor the hypertrophic elongation of the cervix already referred to. Nor do we mean to deny that erosion, eversion, and ulceration of the lips of the external os take place in the major degrees of prolapsus in consequence of the traction of the vaginal walls and friction against the exposed cervix. Of course the bladder is dislocated with the anterior vaginal wall, so that in many cases a sound or catheter passed into the urethra glides downward and backward. This complication is important, for not only do traction and dislocation tend to the production of cystitis; it is further induced by reflex irritation and by decomposition of urine occurring from retention, after urination, in the pocket formed by the inverted wall of the bladder. By a similar process prolapse of the anterior wall of the rectum occurs and results in fecal impaction at this point.

Sudden or Acute Prolapsus may come on from any great effort, a fall, or violent contraction of the abdominal muscles, acting upon a uterus which is enlarged by hyperplasia, subinvolution, pregnancy, or tumors. It may even occur to a uterus normal in size and consistency. In an instant the patient feels that something has given way within her, becomes prostrate and much alarmed, and suffers pain of an expulsive character, as if desirous of forcing something from the pelvis. We have twice seen it occur within a fortnight after delivery from sudden and violent muscular effort, and three times in virgins in consequence of the sudden lifting of a heavy weight. One was the case of a girl of nineteen years in whom the cervix was driven out of the vulva, the body being arrested by the sphincter vaginæ and perineal septum. When first seen, a year after the accident, she was suffering intensely from the displacement, but from false modesty had never told of it. Distinct traces of the hymen were visible, which, there was every reason, both physical and moral, to believe, had not been ruptured by sexual congress. In a second case, a girl of twenty-three, the prolapsed uterus and vagina had become so œdematous that it required twenty-four hours of compression by the elastic bandage before it could be replaced. Some months later the ruptured perineum was repaired by the flap-splitting operation.

In such cases as these it appears to us highly probable that the utero-sacral ligaments are ruptured. This supposition, the difficulty of proving which by necropsy is apparent, may have attracted attention, but the only allusion to it which we have met with is the following from Courty, who, in speaking of the utero-sacral ligaments, says, "If they are stretched or *broken*, the entire organ falls."

In acute prolapsus, should reduction not be effected at once, violent pain will be felt over the sacrum and groins, and the degree of traction exerted upon the pelvic peritoneum may result in dangerous inflammation. Besides, œdema of the prolapsed uterus and vagina may occur, due to interference of circulation.

Treatment.—The first indication as to treatment is to return the displaced organ to its normal position; the second, to keep it there.

Methods of Replacing the Uterus.—In general, no difficulty will attend the performance of the first indication, but in some cases careful and intelligent taxis will be necessary. The best method for applying this is the following: The patient, after thorough evacuation of the bladder and rectum, if this be possible, should be placed in the genu-pectoral position, in order to cause gravitation of the pelvic and abdominal viscera toward the diaphragm. She should not kneel upon a soft or yielding bed into which the knees would sink, but upon the floor or a table, for the object of the posture is to elevate the buttocks and depress the thorax as much as possible. Ten or fifteen minutes should then be allowed to elapse before any efforts are made at reduction. In this time the intense congestion which exists in the pelvic viscera will greatly diminish. The operator, then taking the cervix into the grasp of his index, middle, and ring fingers, pushes the uterus firmly and forcibly upward in coincidence with the axis of the inferior strait. While the right hand is thus employed the left rests upon the back of the patient and steadies her body. No sudden or violent force is exerted, but by steady pressure, kept up, if necessary, for fifteen, twenty, or thirty minutes, the uterus is restored to its place.

Few cases will resist this kind of effort at reduction, although some may do so. For example, we have already referred to a case in which an incarcerated uterus, which appeared upon the point of becoming gangrenous, could not be reduced by the method described, and in which, as no time was to be lost, we produced complete anæsthesia, and then, taking the organ firmly in the extremities of the thumb and three fingers, we carried it by main force into position. Where œdematous swelling of the prolapsed organs prevents their reduction, fomentations with cloths dipped in a hot solution of liq. plumbi et opii, equal parts, if necessary followed by compression by a flannel roller or an elastic bandage, may be necessary, as referred to on the preceding page.

Methods of Sustaining the Uterus.—Before pursuing any special course of treatment for this end the practitioner should endeavor to discover the cause of the descent. If it be due to increase in the weight of the uterus or to pressure exerted upon it from above, it is evident that the indication will be very different from what it would be if the cause were traction by a prolapsed vagina. Unfortunately, however, after the disease has existed for some time it is often impossible to fix definitely upon the cause; for even if it were originally increase of uterine weight, the lengthy inversion of the vagina and stretching of the uterine ligaments involved in its descent will have destroyed all power in these parts.

As far as possible, however, the original cause should be ascertained, and if it be properly sought for it will in a number of cases be discovered. For example, suppose that there be no excessive enlargement or prolapse of the vagina, no evidence of excessive downward pressure, and yet the uterus lies upon the pelvic floor. Strength should be given to its normal supports.

Suppose, on the other hand, that the vagina be found to be in its normal state, and the prolapsed uterus to be very heavy, weighing perhaps three times what it should. This increase of weight should receive especial attention.

If, again, the insignificant, atrophied uterus of an old woman of seventy be prolapsed into a large, flabby, non-contractile vagina, traction by this vagina may safely be accredited with the uterine displacement.

Lastly, if the common coincidence of rupture of the perineum with subinvolution and prolapse of the vagina and uterus be encountered, it may be assumed that increase of uterine weight, loss of support, and traction have all combined to bring about the issue.

It should be the care of the physician to keep every one of the indications suggested by these factors in mind, and in every case attend first to that which concerns the primary and most important; afterward to those which are secondary and created by the displacement itself.

A very important question offers itself for consideration here: Is it possible to give relief in an aggravated case of prolapse in the third degree without resort to operative procedure? The position has of late been taken by high authority that surgery must always be invoked as our final resort in such cases, and that less radical treatment should be looked upon as palliative and in great degree preparatory. This we regard as a doctrine calculated to do great harm, and one which entirely misrepresents the true requirements of the subject. We should state the matter thus: In a very large majority of cases of prolapse of the uterus, whether in the first, the second, or the third degree, relief may be obtained without resort to operation; in a certain number of cases, where traction by the prolapsed vagina, rectum, or bladder is the cause of the uterine displacement, it should be our chief resource. Now, it may be said in reply to this that even if such traction was not a primary factor in the displacement, it is always a secondary one, and, like a great many theoretical observations, this will carry weight. But it is not really a valid argument at the bedside for him who studies these cases from a scientific standpoint, however powerful it may be in the mind of the empirical gynecologist. If the perineum have lost all power, and a loose, flabby condition exist in the vagina from subinvolution or hyperplasia the consequence of prolonged congestion, and the resulting vaginal, vesical, and rectal prolapse has dragged the uterus down, operation merely fulfils the important indication of removing the cause of the trouble, and logically presents itself as an important resource. If, on the other hand, a heavy uterus presses down of its own weight or a normal one is forced down by pressure from above, closing the perineum or contracting the vagina by colporrhaphy is illogical, unnecessary, and empirical. We would conclude this part of the subject by repeating that operative procedure for uterine prolapse should be only exceptionally resorted to, and then to fulfil an indication, not to comply with a dogmatic rule.

We have seen numerous cases in which entire relief to complete prolapse was afforded by means which will soon be mentioned here. So complete was this that the patients thus relieved would not listen to the proposal of operation. It is true that complete cure was not effected, but complete relief was. If the operative procedures for such cases were simple, entirely free from danger, and certain as to result, a universal resort to them would be indicated; but they are not so. We would not willingly appear to oppose operation in these cases, for we favor it and constantly practise it. We merely urge the application to them of the ordinary rules which govern the scientific surgeon elsewhere.

We will now consider in order the methods most appropriate for resisting each of the pathological conditions which result in uterine prolapse.

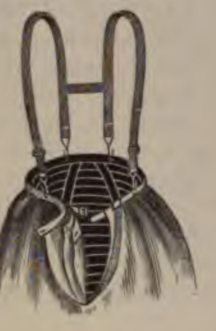
The means adapted to prevention of pressure from above are—

Removing weight of clothing by use of skirt-supporters;
Removing weight of intestines by prohibition of tight clothing, use of an abdominal supporter, and avoidance of injurious muscular efforts;
Preventing accumulation of urine and feces.

The skirt-supporter is merely a pair of suspenders that may be contrived by any woman of ordinary ingenuity, and which enables the patient to carry the whole weight of the under-garments upon the shoulders. A representation of a very good one will be found in Fig. 179. An excellent contrivance of this kind is sold by a Mrs. Richardson of New York, who has supplied many of our patients (P. F. M.). It is simply a combination of suspenders and shoulder-braces, which support the skirts and draw back the shoulders, and thus aid in keeping the figure erect. For this latter purpose it is very useful for growing girls. Or the skirts may be affixed to a waist, which replaces the corset, by buttons, as shown in Fig. 180.

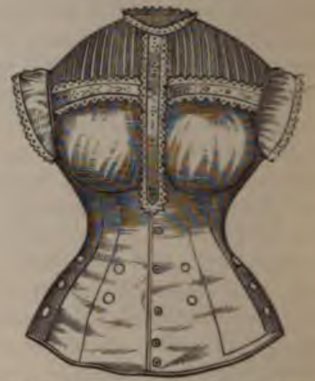
There are many varieties of the abdominal supporter, some of which, unfortunately, are so constructed as to do absolute harm. Should compression be exerted by them upon the abdomen above the navel, it will tend to increase pressure upon the uterus, or at least to annul all the benefit of that exerted below this point. The principle upon which these supporters should act is this: they should do just what the patient's hands do when she places them above the pubes and lifts the abdominal viscera. Some of them are composed simply of bands of thick cloth, others are pads or disks of horn or metal, with encircling bands like those of the hernial truss. The physician may choose intelligently, if he only bears in mind what it is that he desires to accomplish by them.

Fig. 179.



Skirt-supporter.

Fig. 180.



Waist with Buttons for Support of Skirts.

During the continuance of treatment the patient should be limited as to exercise and confined to bed during menstrual epochs, when the uterus is known to be heavier than at other times. Should the accident have immediately followed parturition, she should be kept in the recumbent posture to favor the accomplishment of involution.

Means adapted to diminution of uterine weight are—

Removing polypi, tumors, etc. by operation;
Removing uterine inflammation, hypertrophy, and congestion by appropriate treatment;
Amputation of the neck of the womb;
Repairing laceration of the neck.

Sometimes, by applying appropriate treatment to an enlarged cervix, the uterus is in time so much lightened by cure of attendant hyperæmia that relief is effected, but in other cases the hyperæmia is so persistent and rebellious that these means fail, and resort must be had to more powerful ones. A lacerated cervix will often prove a focus of irritation, and thus a cause of uterine congestion and hyperplasia, which may result in descent of the uterus. Under these circumstances closure of the laceration will often effect a complete cure, and it should without delay be performed.

In some cases, even when parturition has never occurred, hypertrophy of the cervix occurs and proves a cause of prolapsus. For this resort has been had to amputation of the neck. Huguier of Paris was in 1848 the first to perform this operation for prolapsus, though it has long been resorted to for cancer. Since that time it has been performed by many others, after methods which will be described later on. It must not be supposed that the mere removal of superabundant tissue is relied upon for the diminution of uterine weight. It is rather the derivative and alterative influences set up by amputation of which the surgeon endeavors to avail himself. Besides, the cicatricial contraction of the vaginal vault following the operation exerts great influence toward retaining the uterus in its normal position.

Means for strengthening or supplementing uterine supports:

The recumbent posture;
Local astringents and tonics;
General tonics;
Exercising the retentive powers of the abdomen;
Pessaries.

The recumbent posture, persistently persevered in, accomplishes a great deal of good in cases of prolapsus in the first, and sometimes even in the second, degree. The buttocks being elevated, the uterus retreats from the pelvis and its supports are left entirely at rest. Opportunity is thus afforded the weakened tissues to contract, to gain tone and strength, and in time to resume their functions. The results of posture may be materially increased by simultaneous employment of the following agents:

Astringents and Tonics.—By these means the pelvic tissues may be made to sustain the uterus for a time, and thus, by keeping it out of danger of congestion from interference with circulation, opportunity is given for removal of engorgement or slight hypertrophy.

The astringents most commonly employed are tannin, alum, persulphate of iron, and the bark of the white oak. They may be injected into the vagina in solution or infusion by means of the ordinary syringe. A very excellent astringent under these circumstances is the infusion of the sumach-berry, which grows commonly by our roadsides throughout the country. The introduction of these agents in the dry pulverized state on pledgets of cotton or wool is a far more thorough method than by means of solutions or injections. Tannin and iodoform, equal parts, or alum and subnitrate of bismuth, 1 to 4, are our favorite remedies. They should be inserted at least every other day.

Tonics may be locally applied by the use of cold hip-baths, douches, sea-baths, and by copious vaginal injections of cold water, salt and water, or sea-water.

General tonics, mineral and vegetable, should be employed. Among these, ergot, strychnia, and iron may be specially mentioned. Sea-bathing is peculiarly beneficial for this purpose, for it not only acts locally, but improves the tone of the whole system. In speaking generally of the influences which sustain the uterus, the peculiar retentive power of the abdomen has been mentioned very fully. Habits of life with reference to exercise, dress, etc. exert a marked influence over this power. The woman who rarely exercises so as to call for full expansion of the lungs gradually diminishes her breathing power, and in the end suffers from atony of the thoracic muscles. This renders diaphragmatic action feeble; the alternate rise and fall of the abdominal viscera is lessened; they settle down upon the pelvic viscera; and the abdominal muscles lose their power and activity. This result is produced not only by a life of inactivity, which enfeebles the muscles which accomplish thoracic and abdominal respiration by want of use, and thus indirectly lessens diaphragmatic action; any influence which directly interferes with the piston-like action of the diaphragm or indirectly enfeebles by prolonged pressure the thoracic and abdominal muscles tends to overcome this important function of the abdomen in supporting and keeping the uterus in good circulatory condition. Should any one doubt this, let him examine with Sims's speculum several tightly-laced women who since childhood have done all that art could do to annihilate this sustaining power of the abdomen, and then the same number of women undeformed by the pernicious habit. Let him even examine the same woman with and then without corsets, and he cannot fail to recognize the slight uterine movement in the one case, and the active, vigorous rise and fall in the other.

As the power of the abdomen is destroyed by pernicious habits, it may with perseverance and judicious efforts be restored, and the importance of striving to accomplish its restoration in all cases of uterine displacement cannot be too strongly insisted on. This should be done first by freeing the trunk from all constriction and weight; second, by causing free action of the diaphragm by general exercises which cause this muscle to work vigorously; and, third, by the practice of special exercises adapted to development of the thoracic and abdominal muscles. As excellent general exercises may be instanced rowing in a light boat or upon a rowing machine,[1] practising the "lift cure," the use of Goodyear's "parlor gymnasium," or calisthenics. Walking and riding, either in a vehicle or on horseback, are excellent in their results upon the general health, but they fail utterly in fulfilling the special indication required. They improve nutrition and strengthen the muscles of the lower extremities, but not those of the upper portion of the trunk. Their substitution therefore for those just mentioned is an error. They may add to the general good accomplished, but do not develop either the lost function or the muscles which should perform it.

There are also particular exercises adapted to the especial development of the abdominal muscles, at the same time that they excite an exaggerated action on the part of the diaphragm, and tend by that and by gravitation to raise the pelvic viscera. For full descriptions of these manœuvres we will refer the reader to the works devoted to the systematic development of the muscles of the body.

Of recent years, following the lead of a layman, Major Thure Brandt of Stockholm, who laid aside the sabre to take up the practice of manipulation and massage of the muscles of the human body for tonic and restorative purposes, Schultze of Jena, the great apostle of the mechanical development and treatment of uterine displacements,

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[1] Implements for these exercises are on sale in all our large cities.

Profanter, his pupil, and others, chiefly in Germany, have practised and loudly advocated the treatment of prolapsus uteri by this method, and have reported marvellous results. Aside from the tedious and rather delicate nature of the treatment, it is still too new to permit our accepting it without reserve. The details of the manipulations are too minute for reproduction here, and must be read in the original works. The method undoubtedly has much in its favor and deserves careful study.

Pessaries.—The plan of supporting the prolapsed uterus, vagina, bladder, and rectum by mechanical contrivances which supplement the enfeebled natural supports constitutes a method of great value, and one which should never be cast aside. In a great many cases objections of advanced age on the part of the patient, want of skill on that of the physician, and the uncertainty as to result which attaches to all surgical procedures for the cure of prolapse, render a resort to a method which relieves very greatly, during even a long lifetime, one which is dictated by prudence and good sense. To support four organs, the vagina, uterus, bladder, and rectum, which are and have been for a long time prolapsed, by an artificial mechanical means frequently taxes the skill of the ablest gynecologist and sometimes utterly defeats his best attempts. Let the general practitioner bear this undeniable fact in mind, and not become discouraged by difficulties nor disheartened by repeated fruitless efforts. Let such a one who reads this believe too the assertion which we here make, that we advise no instrument merely because it has been generally accepted, and that we limit ourselves to the mention of those only which we daily employ in practice with good results.

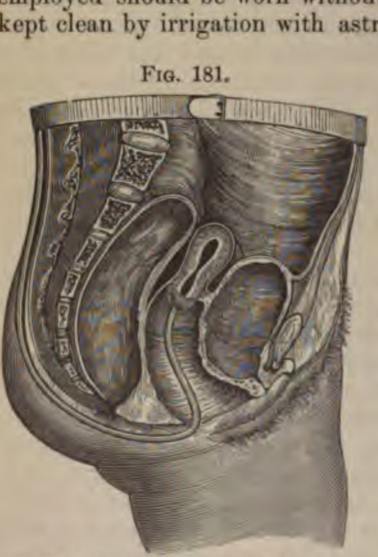
In employing pessaries for all the varieties of prolapsus of the pelvic organs the desideratum is an instrument which will not distend the vagina at the same time that it will support the uterus. Such instruments as sustain the vagina without distending it, and thus allow it to regain something of its former tone and elasticity, are those which should be, as far as possible, selected. The great functions which, in the majority of cases, are required of a pessary in prolapsus are these: first, to supplement the action of the utero-sacral ligaments, the chief factors in sustaining the uterus; second, to keep the vagina, bladder, and rectum in place, so as to prevent them from perpetuating the uterine displacement by traction.

We have already said that he who treats this condition, in any of its varieties, by replacement and support by a pessary must frequently meet with insuccess. Is it not illogical to suppose that by any mechanical contrivance heavy, congested, and prolapsed organs, often four in number, very generally three, can be, without preparation or the use of allied means, kept at once in normal position? Yet such a result is often anticipated. Before resorting to a pessary at all it is a good plan to keep the patient in the recumbent posture for a few days, or if possible a week, with the foot of the bedstead elevated twelve inches for the purpose of allowing congestion to pass off. During this time mild cathartics should be given to further this end by removal of fecal matter and stimulation of hepatic circulation, and the vagina should be systematically and copiously irrigated with astringent fluids, or packed with tampon, covered with dry astringent powders, to harden its tissues in preparation for a pessary, to effect support of the uterus, bladder, and rectum by a re-establishment of its sustaining power, and to cause contraction in its distended superficial blood-vessels. This time is not wasted, for the case is sure to be a lengthy one, and at the end of it the patient is much better able to begin treatment of a mechanical kind without meeting with mishaps, which in the commencement dishearten and discourage her. Nowhere is the statement more true than here that a good beginning advances us halfway to success.

The patient having risen, all of these means, except recumbency, should be continued throughout treatment, and others which are adjuvants to the pessary should be adopted, as, for example, removal of weight of clothing; avoidance of deleterious muscular efforts, long standing, and constrained postures; diminution of weight of uterus; development of retentive power of the abdomen; and others which have been already enumerated. Having attended to all these points, the pessary presents itself as a valuable resource by which to complete and effect restoration of the parts: without attention to them it is, as a rule, too feeble to accomplish, unaided, the desired result.

Let us suppose that we are dealing with a case of prolapse in the first or second degree, what pessary should we choose? This will depend upon the amount of weight to be sustained. If this be great, subinvolution of the uterus existing and depressing the organ, very possibly no internal pessary will succeed; if it be moderate, almost any one of this list will do so: Meigs's elastic ring, Hodge's, Smith's, Hewitt's, or Thomas's pessaries, all of which are shown by diagrams in connection with retroversion. None should be used which distends the vagina, and that employed should be worn without any sense of discomfort; should be kept clean by irrigation with astringent fluid every night or night and morning; and should be examined at intervals by the physician to make sure that it is not injuring the tissues.

FIG. 181.



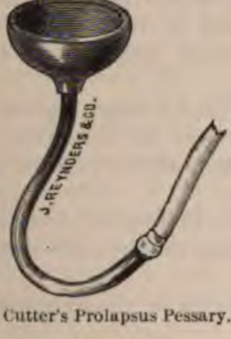
Cutter's Prolapsus Pessary in Position.

If the great weight of the uterus renders these pessaries, which pass entirely into the vagina, ineffectual, or should the case be one of prolapse in the third degree, others, which are in part external and in part internal, should be employed. We very rarely attempt to sustain a completely prolapsed uterus by an internal pessary, because we usually despair of success, and because we have known such evil consequences result from them in such cases that we are unwilling to let the patient pass out of our sight with one in place. An exception to this rule must be made in favor of the Gehrung pessary, already described under Cystocele (see p. 177 and Figs. 64, 65), which we have found of incalculable benefit in those cases where the anterior vaginal wall and bladder are chiefly prolapsed with the uterus, the descent of the former organs having in all probability preceded, and to some extent produced, the prolapse of the latter. Here we have often found a well-fitting Gehrung to retain both cystocele and uterus in perfect position, without pain or inconvenience to the patient other than the usual occasional removal of the pessary to prevent its cutting or eroding the vagina.

In other forms of prolapsus, where the prolapse of the posterior vaginal wall predominates or the whole vagina is prolapsed, it is usually safer, more effectual, and more comfortable for both physician and patient that she should wear an instrument which she can remove at will, allow the parts to rest during the hours of recumbency, and replace upon rising.

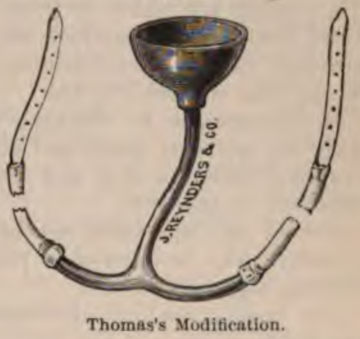
There are three methods by which such support may be furnished: by a stem curling over the perineum, by one passing out of the vagina over the symphysis pubis, and by one ending at the middle of the vulvar opening and resting upon a bandage passing beneath it. Of these plans, the best is the first, and the next in merit the second. The third is objectionable on account of the want of some point of support against which to fix the distal extremity of the stem and to prevent motion in it.

Fig. 182.



Cutter's Prolapsus Pessary.

Fig. 183.



Thomas's Modification.

No pessary with which we are acquainted so universally answers the indications of supplementing the action of the utero-sacral ligaments and sustaining the prolapsed vagina, rectum, and bladder as Thomas's modification of Cutter's admirable pessary, shown in Figs. 182 and 183. The cup at its upper extremity receives the cervix uteri, and the simplicity of the instrument enables the patient to remove and replace it with perfect facility. This should be done in the recumbent posture upon retiring at night and rising in the morning.

Unless great caution is observed all supporters which forcibly retain the uterus *in sitû* will inevitably produce erosion and ulceration of the part of the cervix or vagina against which the strongest pressure is exerted. Hence they are really all objectionable, and merely tolerated for want of something better.

Means for Preventing Traction by the Vagina:

Perineal support;

Perineorrhaphy;
Colporrhaphy.

Perineal Support.—We have already pointed out the important function of the perineal body in closing the mouth of the vagina and offering a buttress for the support of its walls. When rupture of the perineum occurs its sphincteric powers are destroyed, and the result is sagging of one or both columns of the vagina and coincident descent of the uterus. By firm pressure at the weak spot, by means of a pad or cushion filled with hair, cotton, or air, and combined with an abdominal supporter, to which it may be attached, partial relief is sometimes obtained.

Perineorrhaphy.—Much more complete and permanent support may be given to the vagina, and prolapse of its walls be much more certainly obviated, by restoration of the perineal body by the operation of perineorrhaphy. If the uterus be not very heavy this operation often proves a very excellent means of relief, for it removes the tractile power which pulls down this organ, and thus the cause of the accident is taken away. But this operation, although efficient in these cases, is not likely to prove so where so heavy a weight as a much-enlarged uterus requires support.

It must not be supposed that in cases of prolapsed vagina perineorrhaphy is limited to instances in which the perineal body is ruptured. It is equally applicable to those in which it has lost its power from any of those influences which are mentioned in the chapter upon the Perineum, such as subinvolution, subcutaneous separation of the bilateral perineal muscles, etc. etc.

In all cases, to be effectual, perineorrhaphy must restore the lost organ, the perineal body, and not simply shut the evil from sight by drawing before it a thin and useless curtain which extends from the fourchette to the anus.

Should this operation not be sufficient to remove traction, colpo-perineorrhaphy, or anterior or posterior colporrhaphy, or a combination of these, may be practised.

For these procedures the reader is referred to chapters which have gone before.

By these means traction is taken away from the uterus, and if this was the cause of its prolapse relief will probably follow, but it is never safe to promise a good and permanent result from any of the operations of colporrhaphy. If in a case of laceration of the cervix, relaxation of the vagina, and complete distension or rupture of the perineum the patient is willing to submit to three operations—operation upon the cervix, colporrhaphy upon anterior and posterior walls, and closure of the perineum (trachelorrhaphy, Stoltz's and Hegar's operations, for instance)—cure will often be complete and permanent. This is a trying ordeal, both mentally and physically; nevertheless, most women affected by prolapsus in the third degree would unhesitatingly accept one of even greater severity with the prospect of cure. All these operations can usually be performed at one sitting, and we have had many excellent results by thus combining them.

Not only have efforts of this kind been made for narrowing the vagina and creating an artificial cicatricial anterior or posterior column for the support of the uterus; the actual cautery, mineral acids, escharotics, ulceration created by galvanic pessaries, and sloughing produced by pressure by forceps, have all been tried for the accomplishment of the much-desired end. All these methods have the disadvantages of proving excessively painful after anæsthetic influence has passed off, and of being more unmanageable and less certain in their results than those here described. Hence they have been entirely abandoned, and at the present day only well-planned plastic operations, designed to narrow the vagina and restore the perineum, and thus retain the prolapsed organs on proper mechanical principles, are recognized and practised. Numerous methods of operation have been devised, nearly every prominent operator having his own favorite design for the operative cure of prolapsus uteri. The combination which has done us the best service is that mentioned above; but Martin, Bischoff, Fritsch, Lefort, Simon, and others, mostly Germans, have devised ingenious, more or less complicated, and more or less successful methods, which our space prevents us from describing in detail. (For full descriptions see Martin[1] and Fritsch.[2]) One objection to all these plastic operations is the tendency of the cicatrices to stretch after a time, and thereafter the return of the displacement.

Within the last few years two other operations have been devised on an entirely different principle for retaining a prolapsed uterus in place after its reposition. One consists in shortening the round ligaments through an incision over the external ring on each side of the pubis, and is known by the name of its inventor (or at least perfector), Dr. William Alexander of Liverpool. We have employed it in several cases of prolapsus with very fair success, both as to immediate and permanent results, when the uterus was not enlarged. But we have always added to it the plastic operations on cervix and vagina in order to ensure absolute success. [This is my personal opinion and experience, with which Dr. Thomas does not entirely agree.—P. F. M.]

The other operation is of still more recent date, and comprises the attachment of the fundus uteri to the anterior abdominal wall by means of sutures passed through the whole thickness of the wall and deep into the fundus, which has been exposed by a short incision. Müller of Berne has performed this operation, we believe, more frequently than any other operator, but has given it up because the attachment yielded after a time and the prolapse returned. The same has been our experience in one case, and another case we lost from "intestinal paralysis." We are inclined for these reasons to discountenance this operation. Both these methods will be again referred to in the chapter on the treatment of retro-displacement of the uterus. Finally, mention should be made that the prolapsed uterus has been successfully removed entire in a number of cases by Leopold, Martin, and other bold and enthusiastic operators.

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[1] *Loc. cit.*

[2] *Diseases of Women*, Eng. trans., Wm. Wood & Co., 1883.

CHAPTER XXIX.

ANTERIOR DISPLACEMENTS OF THE UTERUS.

Anteversion.

Definition and Frequency.—This disorder of position consists in an anterior inclination of the uterus, so that the fundus approximates the symphysis pubis and the cervix retreats into the hollow of the sacrum. Although not so frequent as its kindred condition, anteflexion, it is by no means of rare occurrence. At times it presents itself as an annoying complication of areolar hyperplasia or fibroid growths, while at others it is produced without any alteration existing in the uterine parenchyma.

We meet with versions very commonly in the non-puerperal state, although it must at the same time be admitted that anterior displacements generally assume the character of flexions. To give some idea of the relative frequency of the various anterior and posterior displacements, we present the following tables. The first table is one constructed from a valuable statistical report by Dr. Meadows:

Number of cases of displacement examined			84
" " posterior displacement	52	Retroflexion	34
		Retroversion	18
" " anterior displacement	32	Anteflexion	20
		Anteversion	12

It is impossible to reconcile the discrepancy of the results obtained by statistical evidence accumulated by different observers. Thus, for example, out of 339 cases of displacement recorded by Nonat,[1] the following were the number of anterior and posterior inclinations:

Anteversion	135
Anteflexion	33
Retroversion	67
Retroflexion	14

"Anteversion," says Klob,[2] "in general is a rare form of displacement, and occurs much less frequently than retroversion."

Emmet, out of 555 cases of version, found 236 to be anteversion, and 295 retroversion.

Mundé[3] gives the following proportions in 895 cases of displacement:

Anteversion	112
Anteflexion	295
Retroversion	348
Retroflexion (uncomplicated)	55

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[1] *Mal. de l'Utérus*, p. 416.

[2] Klob, *Patholog. Anat.*, p. 68.

[3] "Curability of Ut. Displ.," *Am. Journ. Obst.*, 1881; *Minor Surg., Gynecology*, p. 394.

the remaining 85 cases being instances of latero-version and latero-flexion and combinations of several varieties.

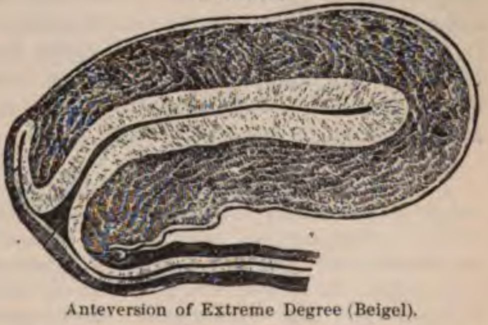
Winckel[1] found in 233 cases 45 anteversions and 188 anteflexions, or 1 to 4; and Schultze, 79 : 296, about the same.

Subjects of this character belong to that class upon which reasoning and theorizing accomplish no good, but rather the contrary. The only way in which they can be settled is by carefully-collected statistics, and one would suppose that this method would be conclusive. Yet we see in the present case how far this is from being the fact. Dr. Meadows's most frequent displacement is M. Nonat's and Scanzoni's least frequent! Nothing but discrepancy and doubt results from the comparison of the figures of these three conscientious observers. "There is nothing," said Sydney Smith, "so unreliable as figures, except facts." After such a comparison of statistical evidence one feels inclined to agree with him.

A possible explanation of this discrepancy may be sought in the fact that, as frequently a version and a flexion both exist at the same time (particularly in retro-displacements), the more prominent condition was chosen as the designation of the case. Hence, retroflexion appears less frequently than the usual primary displacement, retroversion. Such, at least, we know to have been the reason for the comparatively small number of retroflexions (55), as compared with retroversions (348), in Mundé's figures. We certainly feel convinced that anteversion, except in the puerperal condition, is much less frequent than anteflexion.

The normal position of the uterus is one of slight anteversion, the axis of the body corresponding with that of the superior strait, which is a line running from the umbilicus, or a little above it, to the coccyx.

FIG. 184.



Anteversion of Extreme Degree (Beigel).

The degree of this forward inclination may be so increased by slight causes as to constitute a morbid state. As to the line which separates what is normal from what is abnormal, it is impossible to lay down any exact rule; experience must be our guide. In general terms we may say that when the long axis of the uterus is found lying across the pelvis, the fundus near the symphysis pubis, and the neck in the hollow of the sacrum, anteversion exists.

Predisposing Causes.—The predisposing causes of this affection are parturition, enfeebled muscular condition, habits of indolence and inactivity, and loss of tone in the abdominal walls.

The exciting causes may thus be presented:

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[1] *Loc. cit.*, p. 292.

Influences increasing the Weight of the Uterus.—Congestion; Hypertrophy or Hyperplasia; Subinvolution; Fibroids; Pregnancy.

Influences forcing the Fundus directly Forward.—Violent efforts; Abdominal tumors; Tight clothing.

Influences enfeebling Uterine Supports.—Ruptured perineum; Relaxation of ligaments; Destruction of the retentive power of the abdomen; Cystocele.

Influences dragging the Fundus directly Forward.—False membranes; Prolapsus vaginæ; Cystocele; Shortness of the round ligaments (?); Anteflexion.

A large number of cases will be found due to areolar hyperplasia; a number by no means inconsiderable to fibrous tumor; some of the most irremediable cases to false membranes, either binding the fundus to the bladder or attaching the cervix to the rectum (possibly contraction of the vesico-uterine or sacro-uterine ligaments); many to cystocele, which takes away support at the same time that it produces traction; while a few will exist without other apparent cause than direct pressure from some power which forces down the abdominal viscera upon the fundus. The last cause is much aided by laxity of the abdominal walls, which robs the viscera of support.

One fruitful source of the condition is unquestionably the gradual destruction of the retentive power of the abdomen by habits which engender atony of the thoracic and abdominal respiratory muscles and enfeeblement of the action of the diaphragm.

Symptoms.—In a large number of cases anteversion will be found to exist without creating any disturbance either constitutional or local. By pressure of the os against the posterior vaginal wall anteversion may induce dysmenorrhœa and sterility, and by pressure of the fundus against the bladder and the cervix against the rectum these viscera are irritated and interfered with in their functions. The bladder more especially suffers, sometimes a state bordering upon cystitis being engendered. Pressure upon the rectum more rarely produces tenesmus and a painful, irritable state.

[In exceptional cases it is surprising to see to how great an extent locomotion is affected by this condition. My experience furnishes me with four cases in which patients were for long periods confined to bed or the lounge on this account. In one of these the patient had not left the house for four years; in another she had scarcely assumed the upright posture for eight months; the third was the counterpart of the second; while in the fourth the patient for twelve years had never walked over a quarter of a mile without serious inconvenience. In each of these cases positive proof was afforded me of the agency of anteversion in producing the disability which existed, by its removal when the uterus was properly sustained by an anteversion pessary, and by relapse at once recurring when without her knowledge she was left without it. Not one of these women was suffering from that hysterical condition which so often misleads the physician as to the results of remedies.—T. G. T.][1]

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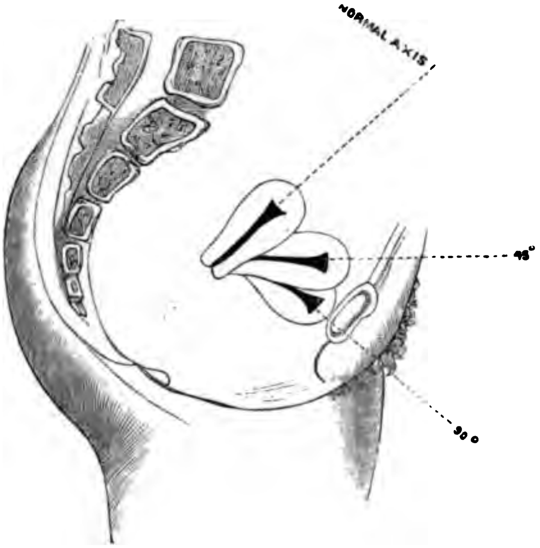
[1] [My personal experience obliges me to disagree to some extent with this view, since I can recall but few cases where an uncomplicated anteversion produced serious symptoms of any kind. Only when the uterus was enlarged by hyperplasia or fibroids,

Course, Duration, and Termination.—Even if the exciting cause of the condition be removed, it will usually continue, for the broad and utero-vesical ligaments have by long distension become stretched and enfeebled, while there has been simultaneous contraction in the utero-sacral ligaments from long disuse. The first fail to aid the fallen organ; the last help to keep it out of position by lifting the cervix up against the rectum. Sometimes cure is effected by pregnancy, the displacement disappearing as involution is accomplished. Usually, however, unless the exciting cause of the condition be removed and the organ be kept in proper position for a year or more, the displacement will continue unabated.

Varieties.—Anteversion may be complete or partial. While there are three degrees of retroversion and of prolapse, there are but two of this displacement, for the axis of the uterine body is naturally inclined so much forward as to prevent us from including slight increase of inclination under the head of disease.

Fig. 185 will show the varieties referred to; an inclination of 45° representing the first degree, or partial anteversion, and that of 90° the second degree, or complete anteversion.

FIG. 185.



The Degrees of Anteversion.

Diagnosis.—When in a case of this displacement vaginal touch is practised, the patient lying on the back, the index finger passed into the fornix vaginæ discovers that the cervix is absent. A rapid investigation will prove that it is not to be found in the pubic or lateral

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or when a prolapsus of the first degree existed at the same time, were the sensations of suprapubic weight, bearing down, and of vesical irritation complained of. And only such cases, as a rule, required mechanical support.—P. F. M.]

regions of the pelvis, and deep exploration with two fingers will discover it high up in the hollow of the sacrum. The finger being then passsd toward the pubes will come in contact with a hard ridge, which will run toward the symphysis. Conjoined manipulation will prove this to be the body of the uterus and complete the diagnosis. Should further evidence be required, the uterine probe, very much curved, may be passed into the cavity, though this is rarely necessary and always difficult.

Differentiation.—Capuron tells us that Levret mistook the first case he saw for stone in the bladder, operated for this, and sacrificed the life of the patient. In spite of such a grave mistake at the hands of so great an authority, it may be stated that there is no diseased condition with which this should be confounded. The disease inducing the displacement may not be recognized, or some serious error may be made as to its nature, but that does not concern the present subject. The recognition of the mere fact of the anteversion is never difficult if proper diagnostic means are brought to its elucidation.

Prognosis.—The prognosis as to any serious injury which will arise from the displacement is decidedly good, although there are many inconveniences and discomforts connected with it—such, for example, as vesical and rectal irritation, neuralgia in consequence of compression of the nerves, and difficulty in locomotion; none of these, however, go on to a dangerous degree of development. If the condition be not treated by mechanical means, it will prove entirely incurable; but by these the prospect of great improvement, and even of complete cure, is very good. Important and early evidences of improvement resulting from mechanical treatment are frequently obtained in disappearance of dysmenorrhœa and sterility. It is often difficult to remove the exciting cause of anteversion, and even should this be accomplished the uterus is so prone to retain the abnormal position in which it has long been kept that great difficulty attends its retention in normal position. One of the reasons for this is the fact, already stated, that the uterine ligaments readily alter their proportions under certain influences. Thus during pregnancy they are all elongated; in posterior displacements the utero-sacral ligaments are stretched; and in anterior inclination the utero-vesical ligaments are similarly affected. As the antithesis of this fact, prolonged absence of function causes contraction in these structures; thus in anteversion the utero-sacral ligaments are generally shortened, and there is no doubt that the round ligaments are similarly altered.

Anteflexion.

Definition.—This, which is one of the most frequent of all uterine displacements, consists in a bending of the organ so that the fundus, the cervix, or both, are bent more or less sharply forward.

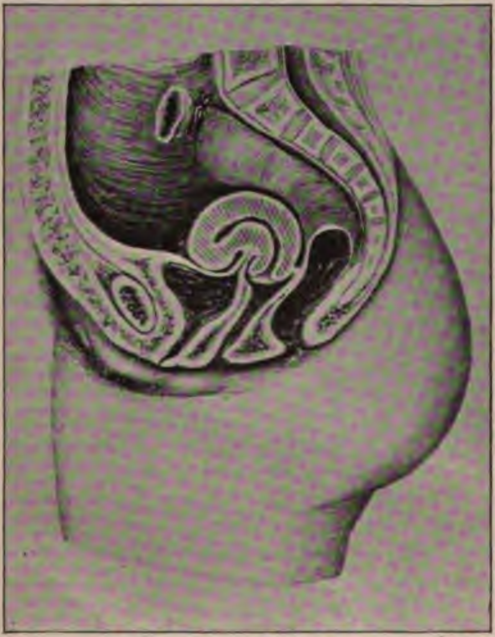
Varieties.—There are three forms of anteflexion: first, corporeal flexion; second, cervical flexion; third, cervico-corporeal flexion.

1st. The cervix being normal in position, the body is flexed;
2d. The body being normal in position, the cervix is flexed;
3d. Both are flexed forward.

The lines represented in Fig. 188 will serve to show the deviations which may affect the axes of both body and cervix.

These varieties are neither arbitrary nor unnecessary. The existence of each may readily be verified at the bedside, and treatment should always be materially modified by the peculiarity of the deviation. It appears to us that a neglect of them and the fixation of attention upon flexure of the body alone has seriously retarded progress in treatment. No one can intelligently treat anteflexion without regard being had to the variety of the disorder to which he is called upon to adapt his mechanical appliances.

FIG. 186.



Anteflexion of the Uterus.

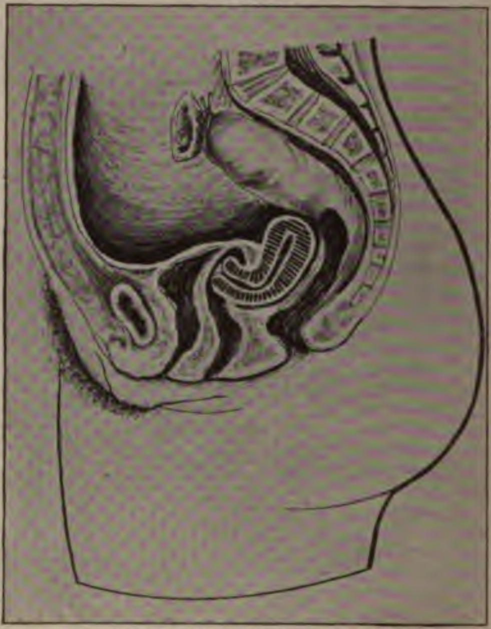
Besides, there is a not uncommon form, usually congenital, in which the cervix is flexed upward and the body forward, while the whole uterus is tipped backward on its longitudinal axis, as though it swung on a horizontal pivot. This condition is called retroposition with anteflexion.

Symptoms.—The necessity of these displacements may exist for years without the development of symptoms. In aggravated cases, however, obstruction to venous return at the point of flexure produces congestion, which increases the displacement, disturbs the nervous system, and disorders uterine functions. Then the following symptoms may develop themselves: Pain over hypogastrium; Irritable bladder; Dysmenorrhœa; Sterility.

In some cases there is a morbid and invincible aversion to walking, partly arising from physical and partly from mental causes. We have in several cases seen women who had been bedridden for three and fou years rapidly restored to their powers of locomotion by restoration of the uterus to position and its retention by an efficient pessary.

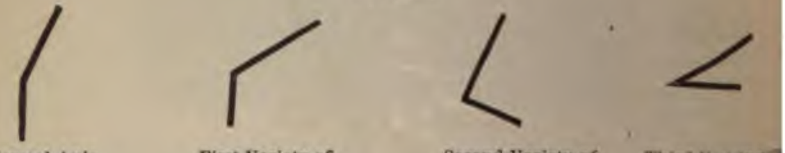
Dr. Hewitt mentions the retention of secundines after abortion in

FIG. 187.



Retroposition with Anteflexion.

FIG. 188.



Normal Axis.

First Variety of Flexion.

Second Variety of Flexion.

Third Variety Flexion.

cases of anteflexion, and their putrefaction *in utero*, and advises treatment restoring the organ to place, when expulsion at once occu

The number and severity of the symptoms produced by anteflex were formerly estimated at a much larger figure, as can be seen by ref ring to the last edition of this work. We have already stated change of opinion since then. Besides dysmenorrhœa and sterility the graver forms, we at present find but few cases of *uncomplica* flexions which produce either severe symptoms or call for treatment any kind.

Physical Signs.—As the finger passes into the vagina and touch the cervix nothing abnormal will usually be discovered. But as it swee along the anterior wall of the uterus, about the os internum a protube ance will be met with which presses upon the bladder. The finger which has thus far explored being kept in contact with this mass, the disengaged hand should then be laid upon the abdomen and made to depress the anterior abdominal wall so as to approximate the finger in the vagina. By this means the shape, size, and sensitiveness of the body may be ascertained, and usually, unless inflammatory fixation is present, the examining fingers can straighten out the uterus. Should the diagnostician, however, still be in doubt whether the enlargement may not be one due to fibrous tumor or an ante-uterine exudation, this point can be settled by placing the patient on the side, introducing Sims's speculum, and gently probing the uterus to the fundus. Giving to the probe the curve which by vaginal touch he has been informed is that of the uterus, he carefully passes it in. Should it not proceed without obstruction, he withdraws it, alters the curve, and tries again. Having succeeded in introducing it, he learns the course of the uterine canal, its length, and the sensitiveness of its walls. Should the probe have entered the mass felt through the vagina, that mass is the uterine body. Should it go in the normal axis or backward, it is not the uterine body, but some growth in contact with it. In pure cervical flexion the neck will be felt sharply bent forward, and in the double form both neck and body will be found flexed.

Prognosis.—As regards the relief of the symptoms the outlook is excellent. Dysmenorrhœa can usually be relieved; conception often follows treatment; hypogastric pain and irritable bladder will seldom resist proper elevation of the fundus uteri by an abdominal or vaginal support. But so far as restoring a sharply anteflexed uterus to its normal shape, and keeping it so after treatment has been discontinued or the supporter removed, that, we are compelled to admit, is in our experience an impossibility.

Practically, therefore, we know of no *one form* of treatment that will permanently *cure* a badly anteflexed uterus.

Treatment of Anterior Displacements.—Nature possesses the only means, and that is the physiological tissue-changes occurring during pregnancy and following parturition, through which the angle of flexion may possibly become effaced and the uterine canal *remain* straight and wide. Hence the importance of adopting measures to bring about this desirable occurrence. As already stated, in our present opinion, based on more recent observations, these displacements produce symptoms and require positive treatment only when in aggravated forms or when complicated with other diseases, such as prolapsus, endometritis, hyperplasia, fibroids, laceration of the cervix, etc. We should therefore be careful first to ascertain the precise influence the displacement has on these complications or the reverse, and then proceed to treat either the displacement or the complications as the case may be. Of course the old rule, first to remove the cause of the disease if possible, should be observed, at the same time, however, not forgetting to do what is best for the symptoms while waiting to effect a radical cure. Hence a pessary may be at once required to relieve present pain while later measures are being adopted to cure the complications.

Means for Reduction.—In the restoration of an anteverted uterus to its place difficulty will rarely be experienced, for, unlike retroversion, the displacement does not often become complete. Even when it does so, reduction may be easily accomplished by the finger, the bladder having been previously emptied. The fundus can then be grasped with the other hand through the abdominal walls, and reduction at once completed. In difficult cases the sound may be employed as a repositor, but we can scarcely recall a case where the fingers alone failed to effect the reduction of either an anteflexed or anteverted uterus.

Fixation of the body of an anteflexed uterus being extremely rare, we have never had occasion to employ one of the instruments devised for this purpose (Elliot's and Jennison's repositors, Wallace's spring tent), which really find such utility as they may possess in retroflexions.

Some practitioners rely for cure upon the daily restoration of an anteverted or retroverted uterus, but hopes thus based will usually prove delusive. Where the version is complete and sudden a return to the normal position may be final, but rarely have we seen it so result where the displacement was incomplete and chronic.

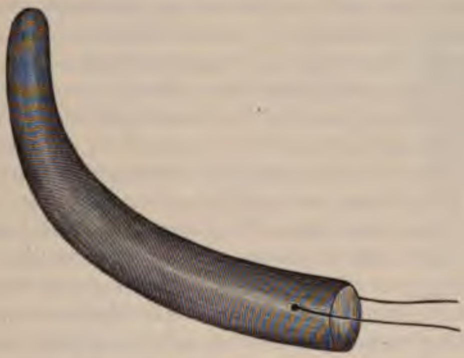
Should it be found necessary to use the sound as a repositor, it is introduced to the fundus, not much curved, but as straight as it can be made to pass; the handle being held in one hand, the tips of the fingers of the other should be pressed against the shaft of the sound near the middle, and, they being made a fulcrum, the handle should be carried to the symphysis. By this manœuvre the flexed fundus is elevated, and at the same time carried toward the hollow of the sacrum. This point being reached, the sound should be very gently rotated, and complete retroversion with partial retroflexion of the uterus accomplished. This should be done with the utmost gentleness and as we have described, not by a sudden rotation of the flexed organ, which forcibly sweeps the fundus around the superior strait of the pelvis.

A repetition of this manœuvre a number of times, at intervals of one or more days, will render the straightening of the uterus more easy at each time. But, of course, as soon as the sound is withdrawn the flexion returns, and means will have to be adopted to keep the uterine axis as straight as Nature designed it to be. These means are twofold: that which by uterine tents and the intra-uterine stem forcibly straightens the bent organ; and that which by the knife or scissors renders the canal straight without reference to the relations of neck and body. Such cases being commonly congenital, one wall is well developed by excessive growth, while the other is dense, rigid, atrophic, and unyielding. They may, however, result from prolonged accidental flexion, with development of slight attacks of peritonitis; even without the last, indeed, for cicatricial retraction of the atrophied section of connective tissue has been found by Klob under these circumstances.

One of the most effectual means of meeting the difficulties of (supposed) irreducible flexion is the use of the spring tent of the late Dr. Ellerslie Wallace of Philadelphia. He passed through a canal made in a piece of carbolized sponge a small piece of watchspring and compressed the sponge, so as to make the tent curved, as represented in Fig. 189.

In this condition it was passed into the flexed uterus, and as the sponge softened the spring erected itself and strengthened the uterus. All the dangers attending the use of sponge tents attended the use of this, but no more. It may be practised once a week until three or four tents are used, or it may be used once and be followed by the intra-uterine stem.

FIG. 189.



Ellerslie Wallace's Spring Tent.

We have retained this description merely as a curiosity, in order to show what desperate means were formerly thought necessary to cure conditions which were either incurable or required no treatment whatever. Nowadays, no well-instructed gynecologist would think of exposing a patient to the dangers of septic infection, or of lighting up again the peritonitis which originally caused the irreducible flexion by using such a contrivance. A much better and safer method of straightening and dilating a flexed uterine canal is by inserting a bent moist laminaria or tupelo tent, and leaving it until it is fully expanded, or by repeated forcible dilatation with a Palmer or Goodell dilator.

One very important fact, however, which should be constantly borne in mind in connection with anteflexion is, that there is a class of cases of irreducible flexions which is incurable. The practitioner, unwilling to admit this to himself or not appreciating the fact, begins treatment from a conventional idea that such is his duty. But the case proves far too obstinate for the ordinary local treatment; tents will not cure it, and trachelotomy, not fully meeting the mechanical indications, fails likewise. If the patient passes the ordeal without being attacked with peritonitis or cellulitis, she in time gives up all efforts at cure or seeks the advice of another physician.

Another class of cases is that which does not require any treatment, for the flexion produces no special symptoms, or if dysmenorrhœa or sterility do call for interference, no remedies should be employed which would be likely to cause inflammation and aggravate instead of improve the condition.

Means of Retention in Position of a Uterus Anteriorly Displaced.—In every case of anterior displacement let the practitioner endeavor to find out which is the main element concerned in its production, but at the same time let him remember that this one has almost surely developed others which are scarcely less important as factors. In most cases, therefore, he will be called upon to direct his attention to all forms of the pathological influence about to be mentioned.

All increased weight of the uterus should be treated by appropriate means: inflammation and its results by methods already mentioned, hyperplasia and hypertrophy by means adapted to their management, and laceration of the cervix by trachelorrhaphy, etc. The fulfilment of this indication alone will sometimes effect a complete cure of anteversion. Whether it does so or not, the next should always receive attention.

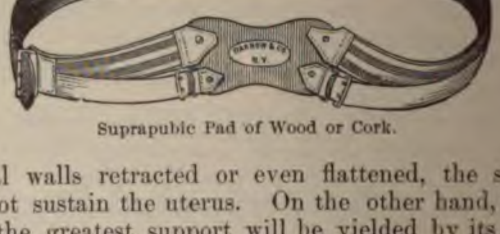
Pressure from above should be removed by carrying the weight of the clothing upon the shoulders by skirt-supporters; pressure of the intestines, by prohibition of tight clothing, the use of an abdominal supporter, and the avoidance of injurious muscular effort.

The dorsal decubitus in cases occurring suddenly, as, for example, during early pregnancy or after labor, is of great value, and even in chronic cases is an important adjuvant to treatment by pessaries. In the commencement of such treatment at least it should be always adopted for two or three hours every day at mid-day, for the purpose of affording a temporary rest to the parts.

In proportion to the disadvantages resulting from corseting the upper segment of the trunk are the advantages to be derived in these cases from thus acting upon the lower. When the abdominal walls are lax and yielding, and do not properly sustain the viscera, they call upon the the fundus uteri and tend to produce and keep up anterior obliquity.

No one can deny that by a well-fitting abdominal supporter tone is given to the lax walls, and that the intestines, not the uterus, are sustained. We have already stated that many are prejudiced against this means and decry it as absolutely injurious; but we see it too plainly and certainly productive of good results in daily practice to admit of any doubt in our minds concerning it. Dr. J. C. Nott offered a very plausible explanation of the fact that in some women benefit follows the use of abdominal supporters, while in others absolute injury results from their employment. "If the patient be emaciated," said he, "and the abdominal walls retracted or even flattened, the supporter will depress and not sustain the uterus. On the other hand, if the woman be corpulent the greatest support will be yielded by its application." We have employed for this purpose with very great advantage an abdominal pad or truss which is at the same time simple, inexpensive, and efficient. It consists of an ovoid block of cedar, pine, or cork.

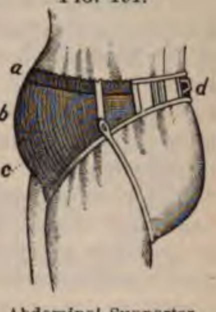
FIG. 190.



Suprapubic Pad of Wood or Cork.

five inches long by four inches wide. This is convex upon the surface to be placed next the body, and flat on the opposite side, and is held in place by an elastic band or slender strip of steel covered with leather, like an ordinary male truss. The pressure made resembles that of the hand, and as soon as patients become accustomed to it, which, it should be borne in mind, may take a little time, gives great comfort. A very efficient abdominal bandage is shown in Fig. 191, and is known as the Thompson supporter. It is knit, and therefore cool, airy, and elastic.

FIG. 191.



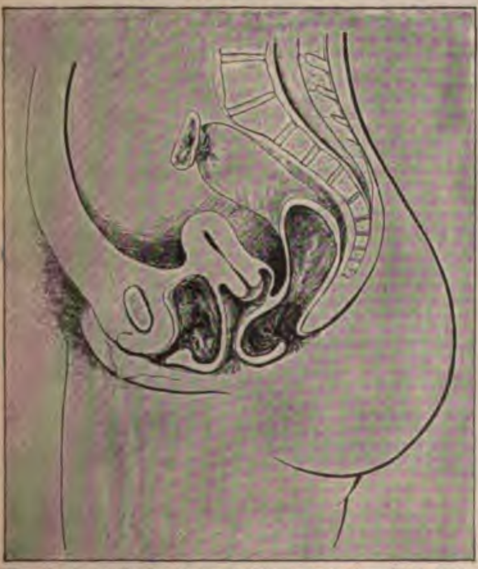
Abdominal Supporter.

Traction upon the uterus from below, if found to exist, should be removed by perineorrhaphy alone or combined with colporrhaphy, or it may be obviated by the use of a pessary which sustains vagina, uterus, and bladder.

Fig. 192 shows how loss of power in the perineum will result in prolapse of the anterior vaginal wall, how the bladder will in consequence prolapse, and how the upper portions of the uterus will follow it, anteversion resulting, and how perfect repair of the perineum, together with anterior and posterior colporraphy if necessary, will remove all traction from the uterus and allow it to resume its place in the pelvis.

Loss of the normal supports of the uterus should be overcome by the use of general and local tonics (which act on general tonic principles), developing the retentive powers of the abdomen, and by the use of pessaries. Astringent vaginal injections, astringent tampons, sea-bathing, and the internal use of vegetable and mineral tonics are unquestionably of value.

FIG. 192.



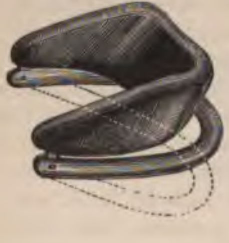
The Perineal Body destroyed, both Rectal and Vesical Walls descend.

By the development of the retentive power of the abdomen a great deal can be done for replacement and support of an anteverted uterus. Every morning and evening the patient should place herself flat upon the back upon her bed, with the hands clasped over the head and heels touching the buttocks. Then she should raise the pelvis as high as possible, and sustain it for a few moments, the shoulders and soles of the feet alone touching the bed. Letting the pelvis slowly descend, she is to repeat this half a dozen times. The movements too for strengthening the abdominal muscles mentioned under treatment of Prolapse should be practised here, as well as the general exercises indicated there for the full development of the thoracic and dorsal muscles.

Pessaries.—What is desired of a pessary in sustaining the anteflexed or anteverted uterus is this: to make gentle pressure on the base of the bladder above the cervico-corporeal junction, and as near to the fundus as possible, to supplement the vesico-uterine ligaments, and at the same time not to injure the vagina by excessive pressure at this point. It is by no means easy to make an instrument answer these requirements; it may either keep the uterus in place at the expense of a degree of force which will create a solution of continuity in the vagina, or it may, when possessed of too little power, allow the fundus in spite of it to fall forward. Even with every precaution cases will commonly occur in which the parts will be injured by pressure, and without precautions the means is one which is attended by absolute danger.

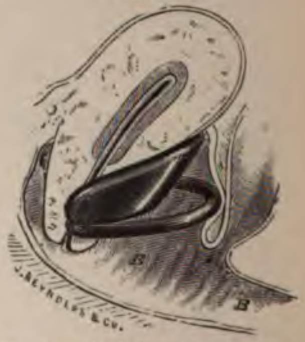
The diagnosis having been made, and it having been decided that the uterus is movable and not attached by adhesions from a former pelvic peritonitis, and that the displacement results from no condition removable only by operation, the treatment should be commenced in this way: The intestines should be evacuated by a cathartic, all weight removed from the fundus by abdominal and skirt supporters, and the patient enjoined to take very moderate exercise and to avoid all violent efforts. Every night and morning she should use the hot vaginal douche, not only at first, but throughout the duration of treatment, to prevent irritation from it. Before the introduction of a pessary the uterus should have been several times replaced by conjoined manipulation, and held in position for two or three minutes at a time. At the end of this period, if the displacement is readily reducible and it requires no great force to sustain the uterus, the anteversion pessary represented in Fig. 193 may be introduced, and the patient allowed to walk about.

FIG. 193.



Thomas's Anteversion Pessary as it appears in the Vagina.

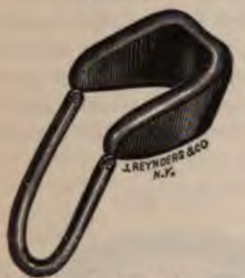
FIG. 194.



The same Instrument in Position.

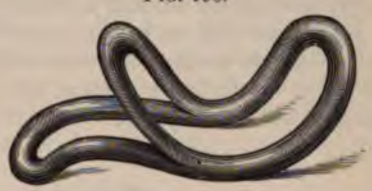
Should it give no pain, she may wear it home, even if going to a distance from the practitioner's residence, for she can herself remove it on the first menace of injury. In three or four days the instrument should be examined. If it have given pain or have left its mark upon the vaginal walls, it should be changed at once; if not, it may be left for a week; then for two weeks; then for a month; and afterward for a still longer time—two months, for example—without examination. The pessary here advised is represented open for introduction and withdrawal, and closed as it lies in the vagina.

FIG. 195.



Thomas's Anteversion Pessary as it appears on Removal.

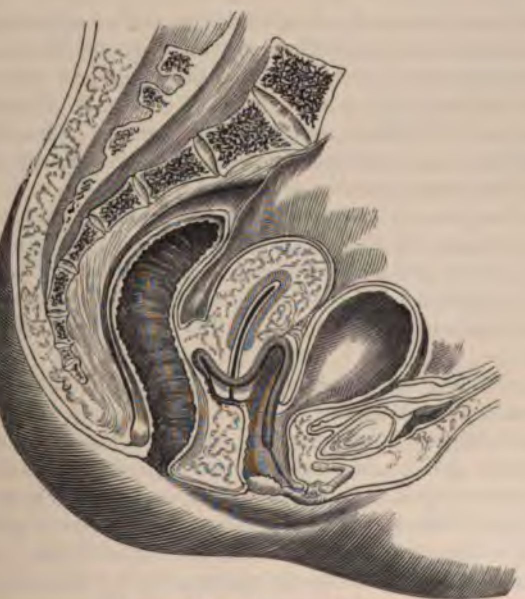
FIG. 196.



Thomas's Elastic Pessary for Anterior Displacements.

Fig. 196 represents an elastic pessary for anterior displacements, made of spiral wire and strips of whalebone covered with gutta-percha, by Otto and Sons of this city. The whole pessary is so pliable that it can be introduced and withdrawn with perfect ease.

FIG. 197.

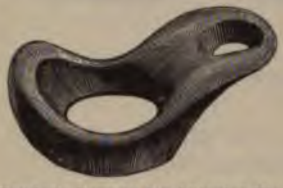


Graily Hewitt's Anteversion Pessary.

Cases will occasionally be met with in which the parts are so sensitive that the hard bulb of these pessaries cannot be borne. Under these circumstances they can be with great advantage replaced by soft balls of very fine sponge, absorbent cotton, or, better still, prepared lamb's wool, until the reposition of the uterus and removal of congestion which is thus effected render solid bulbs tolerable.

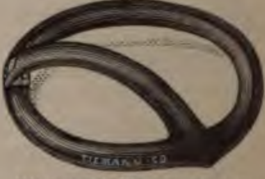
Some years ago we were in the habit of using quite extensively the pessary of Dr. Graily Hewitt, shown in Fig. 197, as also that of Fowler (Fig. 198). But recently we have discarded them almost entirely for the instrument devised by Dr. Gehrung of St. Louis, already referred to (see Figs. 64 and 65). Another useful pessary for anteversion with moderate prolapsus is that of Hitchcock (Fig. 199), which may be used first in its flexible form, and when found to answer the purpose replaced by its counterpart in hard rubber.

Fig. 198.



Fowler's Pessary for Anterior Displacements; also used for Posterior Displacements.

Fig. 199.



Hitchcock's Pessary for Anterior Displacements.

All these pessaries will effect the object of supporting the uterus, and to some extent elevating the fundus of that organ in anteversion. But in anteflexion none of them will succeed in so far straightening the uterus as to entirely efface the angle of flexion. Therefore he who expects from these methods extraordinary results will surely be disappointed. In a certain number of cases failure will attend all means thus far devised, not excepting surgical procedures.

We would especially impress the importance of not relying exclusively upon any one of these pessaries or internal supporters. Their use should be combined with external means calculated to remove pressure from the fundus. By this combination the happiest results may be confidently anticipated from efforts at relief of this often distressing accident.

Before concluding let us recapitulate the most important of the maxims embodied in this chapter:

1st. Never begin treating a displaced uterus mechanically until satisfied that no peri-uterine inflammation exists; that bad symptoms present are due to the displacement; and that no condition susceptible of removal by medical or surgical means requires earlier and more prominent attention than retention of the uterus in position.

2d. Before using a pessary act thoroughly on the intestinal canal, use hot vaginal injections freely, and replace the uterus repeatedly.

3d. Do not rely upon vaginal support alone, but aid it by avoidance of all pressure from above and by using an abdominal pad.

4th. Never use a pessary which the patient cannot remove unless she keep within reach of your aid; always examine frequently to see if injury is being done to the vaginal walls, and never let a patient wearing one pass entirely out of observation.

5th. If no sufficient pouch exist anterior to the cervix for the accommodation of an internal pessary, create one by use of the external bulb pessary.

As already intimated, in many cases of this variety of displacement a great deal of relief may be obtained from merely lifting up the displaced organ in the pelvis, without rectifying the anterior displacement; and for one who is not familiar with the use of anteversion pessaries, or has not at his command facilities for procuring good instruments, we really think that this, in the commencement of the treatment, if not throughout its entire course, is the safer and better plan. This may be easily accomplished by means of a flexible ring pessary (Meigs's or Peaslee's) and the simultaneous use of the suprapubic pad of wood or cork.

While, technically, it may be more difficult to elevate an anteverted or an anteflexed uterus by means of a vaginal support than is the case with the retro-displaced organ, owing to the want of a proper base or fulcrum from which to exert the upward force, our latest experiences have convinced us, fortunately, that uncomplicated anterior displacements are by far less serious in their consequences, and require mechanical treatment by no means as often as backward deviations.

If the uterine congestion so commonly present in these cases has been relieved by appropriate measures (hot douches, iodine applications to cervix and vaginal vault, glycerin tampons, recumbent posture, saline laxatives, etc.); if laceration of the cervix has been repaired; if chronic endometritis has been at least improved; and if congestion or inflammation of the uterine appendages has been properly treated,—then the displacement ceases to give trouble and requires no special treatment.

In proof of these statements we will merely quote Winckel, who on page 302 of his work (*op. cit.*) says that he is indebted to B. S. Schultze for a change in his views to the effect that since he has recognized that "anteversion and anteflexion are most frequently due to extra-uterine causes," he has found intra-uterine treatment to be out of place so long as these causes are in force. Further, Mundé (*Min. Surg., Gynecology*, p. 394) states that of 407 cases of anterior displacements (295 anteflexions and 112 anteversions) only 40 (28 flexions, 12 versions) were treated with vaginal pessaries and 16 with intra-uterine stems. The reasons why supporters were thought necessary or beneficial only in 56 cases out of 407 anterior displacements, as compared with 127 out of 403 cases of retro-displacement, is that the symptoms produced by the anterior displacements were so much less acute than those of the posterior dislocations, and consisted chiefly of dysmenorrhœa and sterility; that a supporter was indicated only in the aggravated forms; and the flexions were treated and benefited generally by repeated active dilatation by divergent steel dilators. While we have thus materially changed our views regarding the relative pathological importance of anterior and posterior displacements, we would by no means wish to be understood as abandoning the mechanical supports designed for the former, as our lengthy description of them sufficiently shows.

As there are men who to-day still doubt the efficacy of support for posterior forms of displacement, there must be many more who entirely oppose that for anterior. To both classes of objectors we would say, with a confidence resulting from a large daily experience, that the hostility to mechanical support in both varieties of displacement arises partly from prejudice, and partly from want of skill on the part of the practitioner, who charges to the mechanical process shortcomings which really lie at his own door.

On more than one occasion we have heard the most unmeasured denunciations against pessaries upon the part of men who we found had been persistently using them upside down. Failing to give relief by instruments thus used, the illogical experimenters have been too willing to attribute to a method what was really due to an ignorant abuse of it.

Intra-uterine Stems.—In certain cases of anteflexion, notably those requiring the energetic means recently mentioned for their reduction, pessaries resting in the vagina fail to accomplish the required purpose, and the use of more powerful means of support are resorted to.

The first to devise an intra-uterine support was Möller, who in 1803 constructed a stem composed of an elastic catheter with a flexible wire stylet. Amussat followed in 1826 with a smooth ivory stem, and Velpeau, Simpson, Valleix, and Kiwisch about 1850 almost simultaneously revived the idea.

The instrument known as the intra-uterine or stem pessary unquestionably counteracts directly and immediately all flexions of the uterus. But it was found to cause peritonitis and death in a number of instances, and in consequence it was for a time almost entirely abandoned. So decidedly did experience appear to weigh against it that it became difficult to explain the encomiums once showered upon it by its advocates and the remarkable cures reported from its use. Nevertheless, the method was never entirely cast aside, for none could hesitate to indorse the sentiment expressed by Malgaigne in the discussion upon the subject in the Academy of Medicine in Paris in 1852, that "a treatment which Amussat, Velpeau, Simpson, Huguier, and Valleix had tried cannot, should not, be considered as repugnant to common sense."

During the last twenty-five years there has been evidenced, however, a growing inclination to return to this plan, and the last fifteen have brought forth a number of reports favorable to it. .

At a medical convention held in Innsbruck, Germany, in September, 1869, Spaeth of Vienna and Hugenberger of St. Petersburg expressed their belief in the utility of stem pessaries in anteflexion, and their comparative safety. More recently, Prof. Schultze of Jena advised the use of the intra-uterine stem in certain obstinate cases with proper reserve and caution.

Prof. Olshausen, then of Halle, likewise published his experience with the method. Of its character the reader can judge for himself, for the professor gives accurate data: Out of 297 cases of versions and flexions, 81 were treated by the stem, and 5 were so treated for other conditions than displacement. Peri-uterine inflammation resulted in 7 cases; treatment was stopped on account of hemorrhage or pain 10 times; the stem could not be kept in place 3 times. Of 66 cases in which they did well, in 15 the results appeared to be permanent; in 18 improvement was great and lasted a long time; and in 17 "doubtful permanent results were obtained." In 11 sterility was cured. The stems were worn for periods varying from a few weeks to twenty-two and a half months.

In order to give the reader an idea of the difference of opinion on this question, we will cite a number of names of prominent writers who have expressed themselves in more or less decided terms in favor of or against the intra-uterine stem:

For: Amussat, Simpson, Lee, Valleix, Velpeau, Kiwisch, C. Mayer, Detschy, E. Martin, Veit, Olshausen, Hildebrandt, Haartman, Winckel, Schroeder, Lewis, Hennig, Kristeller, Graily Hewitt, Priestly, Savage, Greenhalgh, Beatty, Courty, Weber, Grenser, Benicke, Beigel, Bantock, Chambers, Atthill, Routh, Van de Warker, Eklund, Noeggerath, Goodell, Chadwick.

Against: Depaul, Raciborski, Piorry, Gibert, Cazeaux, Scanzoni, Hueber, Hohl, C. Braun, Seyfert, Credé, Freund, Spiegelberg, Habit, Retzius, Tilt, Meadows, Oldham, Bennett, West, Duncan, Tait, Skene, Byford, Barker, Emmet.

A Middle Position is occupied by Schultze, Peaslee, Hegar and Kaltenbach, G. Braun, A. H. Smith, Chrobak, Byrne, Kinloch, Studley, Thomas, Mundé.[1] These latter gentlemen do not wholly discard the stem, but permit its use in certain cases in which vaginal supporters have utterly failed to rectify the distortion, and the gravity of the symptoms or the degree of the distortion warrants the use of a remedy which is not devoid of danger. The justifiableness of inserting a stem simply for the relief of sterility probably due to anteflexion will be governed by the same rules as those for other no less dangerous measures—the dilatation of the uterine canal by tents, dilators, and the knife. It is allowable to let the patient run a certain amount of risk in order to gratify her desire for maternity, but she should be made acquainted with the risks, and from her should come the decision.

Precautions and Dangers.—In no case where there is evidence to be felt of a preceding pelvic inflammation should an intra-uterine stem be used. The great danger is in the production of pelvic peritonitis or of acute inflammation of the tubes and ovaries. To avoid this as much as possible we always employ the following precautions: After thoroughly disinfecting the vagina by a 1 to 10,000 sublimate douche, we give the patient an anæsthetic (usually), through Sims's speculum thoroughly dilate the uterine canal with Palmer's dilator, if necessary previously dividing the external and internal orifices with Studley's probe-pointed knife (Fig. 204) or a blunt straight bistoury, and then, again disinfecting the vaginal and uterine canals, gently and carefully insert the stem, never using one longer than two and a quarter inches, so as not to touch the fundus. We now either pack the vagina with iodoform gauze if there appears danger of bleeding, or usually introduce a pessary (Fig. 201) devised by Dr. Thomas, which keeps the stem in place. The stem we employ is either a straight one of hard rubber (see Fig. 200) or a slightly curved one of glass. The patient is at once put to bed, an ice-bag placed over her hypogastrium for twenty-four hours, and she is not allowed to rise for a week or until all abdominal pain has ceased. Any severe or continuous pain in the hypogastric region calls for the immediate withdrawal of the stem, which can be done by the patient herself by simply pulling out the pessary, when the stem will follow of itself. When anteversion is also present the vaginal pessary is not needed, as the stem is retained by pressure against the posterior vaginal wall.

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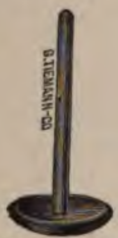
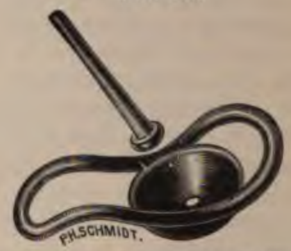
[1] Mundé, *Minor Surg., Gyn.*, 1885, p. 401.

FIG. 200.



Intra-uterine Stem.

FIG. 201.



Cup Pessary for holding Stem in Place.

We usually remove the stem and pessary immediately before and reintroduce them after each menstrual period, in order to facilitate the escape of the discharge; but this is not absolutely necessary. Patients have even been known to conceive with the stem *in situ;* Winckel, Olshausen, Goodell, and others report such cases. In order to permanently straighten an anteflexed uterus, the stem must be worn for months, and even then, unless speedy conception occurs, a cure may not be obtained. Still, dysmenorrhœa has usually been entirely relieved by this treatment in our hands.

Under the above precautions a serious accident now rarely follows this treatment. We ourselves have met with but few accidents and no deaths.

But in a certain number of cases even the intra-uterine stem fails. Then the gynecological surgeon, following the example of the general surgeon, gives up striving after an end unattainable by minor means, and resorts to the knife for relief.

Should the patient not tolerate the intra-uterine pessary with comfort, should the flexion not yield to the treatment by it, or should the practitioner prefer to adopt operative procedures, an operation devised by Sims is at his disposal—not intended to cure the displacement, but to remedy its resulting cervical obstruction, leaving the disorder of position unchanged.

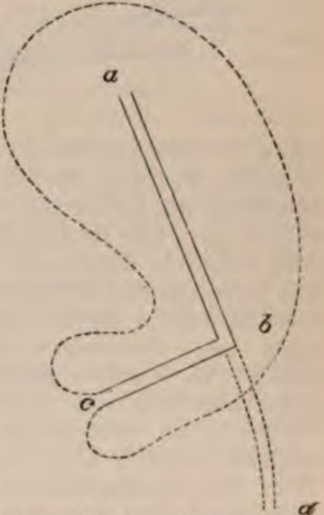
Operation for Irreducible Cervical, Corporeal, or Cervico-corporeal Flexion.—If a piece of stiff tubing be bent, the calibre of its canal will be obliterated at the point of flexion in proportion to the acuteness of the angle created. In the same manner is the uterine canal affected by the lesion under consideration. The obstruction created in this way prevents the free escape of menstrual blood, which distends the cavity of the uterus and forms clots within it, and these at each menstrual period are expelled by uterine tenesmus. In consequence of this, inflammation of the mucous lining of the uterus arises that in time may produce areolar hyperplasia, which favors further displacement by the increase of uterine weight attending it. The effort required for expelling clotted menstrual blood creates painful menstruation, and the same obstruction which retards egress of fluids interferes with ingress and prevents conception.

In spite of the denial of prominent authorities that a flexed uterine canal causes this form of dysmenorrhœa, known as obstructive, we still are ourselves compelled to retain the theory here advanced, both because it seems anatomically correct and logical, and because we know of no better explanation of the facts.

Having been forced to accept the displacement as an irremediable evil, we now endeavor to strike at one of the sources of the pathological series which results from it by overcoming obstruction at the point of flexure; in other words, by substituting a straight for a crooked canal. This can be accomplished by cutting through one wall of the cervix. Having thus overcome cervical obstruction and consequent accumulation of fluids *in utero*, do we at the same time remove the tendency to mechanical congestion of the body of the uterus? Not entirely, but if we secure the results of cervical section, as we may ordinarily do by subsequent use of the intra-uterine stem, we accomplish to a certain extent both results.

If the posterior uterine wall, bent forward as shown by the line *c b*, Fig. 202, in a case of anteflexion, be cut toward the vaginal junction, so that a probe will pass into the uterus in the direction of the line *a d*, the obstruction resulting from the existence of an angle will be removed, and thus fluids will have free entrance and exit, for instead of turning the angle at *b* and escaping at *c*, they will at once escape at *b*.

FIG. 202.



Schematic Diagram, showing the Creation of New Uterine Axis: *a b* represents the axis of the body; *b c* represents the axis of the neck; *b d* represents the axis created by incision.

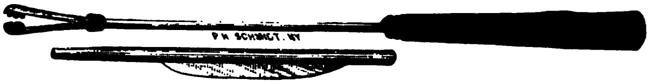
The operation which accomplishes this result is an exceedingly simple one, and is thus performed: The patient being placed in position and Sims's speculum introduced, the cervix is seized and drawn down by a tenaculum. Then by a long slender knife—that of Sims's is the best—an incision is made as far as can be conveniently done without involving the vaginal junction, which will probably be above the point *b* in Fig. 202. The blade of Sims's knife, represented in Fig. 203, is now introduced through the os internum, and the tissues are cut so as to lay open the posterior wall of the cervix. A little shoulder will, as Dr. Emmet has pointed out, be generally found to exist on the anterior wall of the canal, just at the angle made by flexure of this wall. Toward this the blade of the knife should now be turned, and it should be cut through.

FIG. 203.

Sims's Adjustable Uterine Knife.

In this operation the knife alone should be used. None of the uterotomes are at all appropriate. Just after the operation the glass or hard-rubber stem shown in Fig. 200 should be introduced, so as to occupy the whole cervix from above the os internum to os externum. Under

FIG. 204.



Studley's Probe-pointed Knife, for division of internal os.

this a firm tampon of iodoform gauze should be placed, which may be left *in sitû* for five or six days or until saturated, when it should be replaced by another similar tampon if there is the least sign of hemorrhage. If not, the stem may be kept in place by the pessary shown in Fig. 201, daily irrigation with tepid carbolized (2 per cent.) water being used. The patient should be kept in bed at least a week. The same precautions as detailed for the insertion of a stem without this deep incision apply here. Particular attention should be paid to tightly packing the vagina: we ourselves have had one quite serious case of secondary hemorrhage occurring within three hours after the operation, which warned us not to be careless in this respect. The stem and pessary should be worn, if no evil symptoms develop, for two or three months. Then, after cicatrization has fully occurred, they may be removed, with a reasonable hope that the canal will remain pervious.

Success in this operation depends less on its method of performance than on the persistent wearing of the stem until cicatrization has been fully accomplished.

Should an error be made as to the etiology of the displacement or the recognition of its complications, and this apparently trifling operation be performed during the existence of peri-uterine cellulitis or peritonitis, the gravest results may follow and the sufferings of the patient be greatly aggravated. Indeed, had all the fatal cases which have occurred in consequence of this operation been published to the profession, as they should have been, the list would, we think, be a startling one. We ourselves know of several, and have heard rumors of many others. It may be asked why this operation upon the part of the uterus, which does not ordinarily resent surgical interference, should so often be followed by dangerous consequences. Our conviction is that the operation *per se* is not attended by great danger. It is the performance of it when pelvic peritonitis exists in chronic form that has caused it to produce such bad results. Even a minor operation, performed in the face of a condition which should interdict the use of the uterine probe, may set up a train of symptoms which may lead to a fatal issue.

After those procedures for the cure of anteflexion which has for a long time been irreducible, and was very probably congenital, conception is by no means common. Operations for this condition often effect relief of menstrual and amelioration of circulatory disorders; and they may even cure sterility, but he who practises them should beware how he makes promises to this effect.

It is very evident that at present a formidable wave of professional opinion is steadily advancing in opposition to this operation. Some of the very men who took exaggerated positions in reference to its value ten years ago are now emphatic in its denunciation. It is the old story of the swing of the pendulum. The operation should hold to-day just the position to which it was entitled ten years age. Its merits are unquestionable; its place cannot in the interests of gynecology be left vacant. But as it did not deserve the encomiums of a former time, so it does not merit the depreciation which is aimed at it to-day.

One of its advantages has been, we think, lost sight of. Many cases of obstructive dysmenorrhœa, sterility, and inefficient menstruation, for which resort has been had to it with good effect, are due to an undeveloped state of the cervix, which, compared with the body of the uterus, is disproportionately small. Section, followed by the use of the intrauterine plug for two or three months, will often improve the nutrition of the cervix and result in its increased development, as well as stimulate circulation in the body of the uterus and promote a free menstrual flow.

New operations, more or less ingenious and more or less permanent, are constantly being devised for ailments of different portions of the body; and the uterus is no exception to this statement. So far, none has been suggested which would straighten a sharply anteflexed uterus. The latest candidate for professional favor is one by Dr. E. C. Dudley of Chicago, which he demonstrated before the New York Obstetrical Society in Nov., 1890, and at the New York Woman's Hospital at about the same time. Theoretically and at the time of the operation it certainly appeared to do what it claimed. A full description of it will be found in the *American Journal of Obstetrics* for January, 1891.

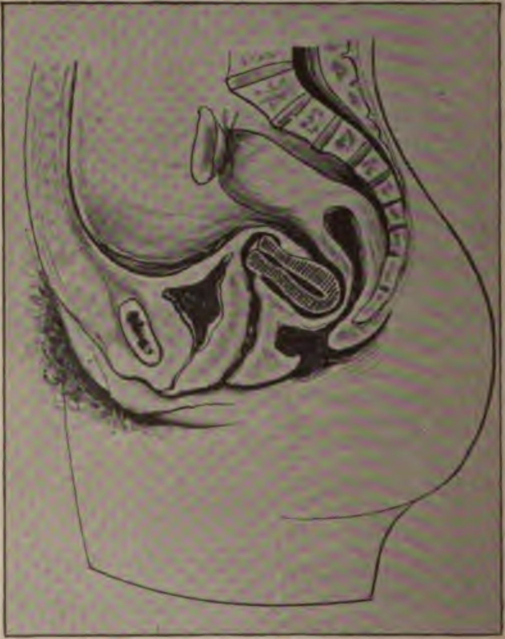
CHAPTER XXX.

POSTERIOR DISPLACEMENTS OF THE UTERUS.

Retroversion and Retroflexion.

Definition and Frequency.—Retroversion consists in a posterior inclination of the uterus, so that the fundus approaches the sacrum and the cervix advances toward the symphysis pubis. As an idiopathic primary lesion it is not common, but it is frequently symptomatic of neoplasms, areolar hyperplasia, or other states which increase the weight of the uterus.

FIG. 205.



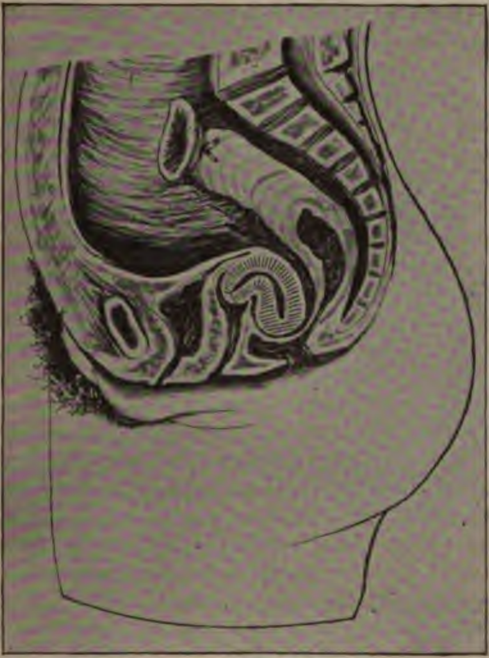
Retroversion of the Uterus.

Retroflexion is said to exist when the body of the uterus is bent toward the sacrum, so as to create an angle on the posterior wall.

Predisposing Causes.—The predisposing causes of posterior displacements are parturition, general muscular debility, and habits of indolence and inactivity.

Exciting Causes.—These may be classified under four heads:

FIG. 206.



Retroflexion of the Uterus.

ences increasing uterine weight:
  - Fibroids;
  - Subinvolution;
  - Areolar hyperplasia;
  - Pregnancy;
  - Congestion.

ences dragging the uterus out of place:
  - Adhesions from pelvic peritonitis;
  - Prolapsus of posterior vaginal wall.

ences forcibly displacing the uterus by direct pressure:
  - Severe succussion by blows or falls;
  - Muscular efforts;
  - Distended bladder;
  - Tumors;
  - Tight bandaging after parturition;
  - Tight and heavy clothing.

ences weakening uterine supports:
  - Parturition;
  - Destruction of power of perineum;
  - Prolapse of vagina.

f all these causes, the two most frequent are decidedly prolapse e vagina from subinvolution or ruptured perineum; and areolar rplasia, commonly the advanced stage of subinvolution of the uterus. All the others mentioned are sometimes met with, but, compared with these, they are insignificant as causes.

As might be presumed from the natural obliquity of the uterus, anterior displacements not unfrequently occur as idiopathic lesions resulting from pressure of superincumbent viscera forced down upon the fundus by tight clothing or muscular efforts. Retroversion occurs in this way less frequently. It generally depends upon some pathological state in the uterus or its appendages. The third class of causes mentioned as displacing the organ by direct pressure may act through violent succussion, and induce sudden displacement with symptoms of most urgent character. Prolonged pressure from a distended bladder or from a tumor anterior to or above the uterus may likewise induce gradual displacement. A little reflection will explain how the management of parturient women, by British and American practitioners at least, favors the occurrence of the accident. In the first place, it must be remembered that pregnancy combines in itself two of the influences which are productive of this condition—increase of uterine weight and relaxation of supports. It is no exaggeration to assert that the usual plan of management after parturition supplies one of the others which are mentioned above. The woman lying almost constantly upon her back, the heavy fundus naturally tends to fall backward into the hollow of the sacrum. Many nurses insist upon this position, and often for days refuse the patient the privilege of lying upon the side. But this is not all: many a nurse's reputation among ladies rests upon her capacity for "preserving the figure" by tight bandaging. A powerful woman will often expend her whole force in making the bandage as tight as possible to accomplish this purpose. No one who has watched the process can doubt its influence in displacing the uterus by direct pressure. There is no practice connected with the lying-in room to which so much of almost superstition attaches as to the use of the obstetric bandage for preservation of the figure and prevention of hemorrhage. This is a repetition of what we have elsewhere stated, but the importance of the subject in our mind must be our excuse for dwelling upon it here.

If involution have gone on tardily and imperfectly, the woman is still more prone to have the uterus forced backward. The round ligaments, which are composed of muscular structure similar to that of the uterus, are important agents in preventing this. It is highly probable that an arrest of retrograde metamorphosis affecting the uterus may likewise affect them, and leave them longer and less powerful than natural. "Hypertrophy of the two (round) ligaments," says Scanzoni,[1] "constantly accompanies a natural pregnancy; while, as we have ourselves had an opportunity to determine, in the case of a bicorned uterus, biparted or bilocular, the ligament corresponding to the side on which was the pregnancy was alone hypertrophied. . . . . We remember many cases of women who have died after metritis or puerperal peritonitis, with whom one or both of the round ligaments were notably hypertrophied, and presented a lively red color with a serous infiltration."

Not only as a result of pregnancy do these ligaments develop a condition which renders them prone to yield to traction from an enlarged uterus—Boivin and Dugès have observed hypertrophy in them, with dilatation of their vessels from chronic engorgement, fibroids, and even from ovarian tumors.

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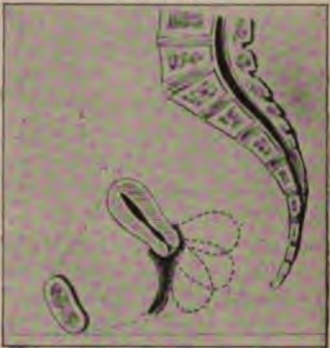
[1] Scanzoni, *op. cit.*, p. 358.

Varieties of Retroversion.—Retroversion may exist in slight degree, the uterine axis inclining so as to make with that of the superior strait an angle of 45°; or it may incline to 90°, thus lying across the pelvis; or the cervix may be thrown up and the fundus descend, so as to form an angle of 135°. These varieties constitute the first, second, and third degrees of retroversion.

Fig. 207.



The Degrees of Retroversion.

Retroflexion also has been divided into varieties dependent upon the degree of intensity, but these are so entirely arbitrary that they may as well be ignored.

Symptoms.—Posterior displacements produce annoying symptoms by creating congestion of the uterine body, obstructing the cervical canal, and causing pressure on the rectum, congestion of the ovaries, and reflex nervous manifestations. Through so many avenues of approach, it may well be supposed that the symptoms are numerous. They are usually as follows:

Severe backache;
Weight in rectum with tenesmus;
Nervous disturbances;
Difficult locomotion;
Menorrhagia;
Tendency to abortion;
Pain on sexual intercourse;
Pelvic and crural neuralgia;
Uterine colic or tenesmus;
Sterility.

Many of these symptoms produce epiphenomena of their own, and thus increase a list which is already long.

Physical Signs.—The diagnosis is made by the following means:

Vaginal touch;
Conjoined manipulation;
Rectal touch;
The uterine probe.

The patient lying on the back, the index finger is introduced to the cervix, which is found in its normal place. It is then swept over the base of the bladder, where nothing abnormal is observed. Then it is passed into the fornix vaginæ, and here a round tumor continuous with the ridge of the cervix is discovered. The disengaged hand is then placed on the abdomen, and made to approximate the finger in the vagina, so as to grasp the body of the uterus. If the abdominal walls be lax, this will yield good results, but not otherwise. The finger should now be carried into the rectum, in order to study further the character of the tumor pressing upon this canal. The sound may now be inserted, or, the patient being placed upon her side and the speculum introduced, the uterine probe, which has been curved in accordance with the direction impressed on the mind by the sense of touch, is gently passed into the uterine cavity to the fundus, which completes the diagnosis.

Differentiation.—This displacement may be confounded with fecal impaction, fibrous tumors, cellulitic or peritonitic exudation, extra-uterine gestation, a prolapsed and enlarged ovary, and prolapsed kidney. The careful practice of the four diagnostic methods mentioned will remove all doubts.

In certain very rare cases the kidney has been known to prolapse into the pelvis behind Douglas's cul-de-sac and produce the most anomalous symptoms.

[In a case of my own, in which a very obscure tumor existed posterior to the uterus, this diagnosis was made by Dr. Noeggerath in consultation. In accordance with his advice I placed the patient in the knee-chest position, and applied a good deal of upward pressure, when the tumor suddenly escaped into the abdomen. Support was given by a bulb pessary, and for a time my patient was relieved, but upon her return to her home in Virginia a complete relapse occurred. Dr. Noeggerath tells me that he has met with but one other such case. Of course the correctness of the diagnosis is doubtful. I am inclined to admit it from the peculiar symptoms exhibited, and by the fact that post-mortem examination proves that such a prolapse of a floating kidney sometimes occurs.—T. G. T.]

The following account of such a case may be found in Braithwaite's *Retrospect*:

"Examining the body of a man who had died of phthisis, aged thirty-five, Dr. Isaacs found the left kidney located in the pelvis, its upper end being in contact with the bifurcation of the aorta, and its lower touching the posterior surface of the bladder, and lying on the fifth lumbar vertebra and first, second, and third pieces of the sacrum. Its right edge was in contact with the rectum, and the left with the iliac portion of the brim of the pelvis. There were three renal arteries—one coming from the aorta, and two others from the right common iliac. The kidney was of the ordinary size, but the suprarenal capsule was twice its natural size and of the shape of a fig-leaf, and it occupied its normal position in the lumbar region."

[I removed a displaced kidney three years ago by laparotomy, having mistaken it for an adherent and enlarged ovary and tube, and not discovering the error until the enucleated organ was brought out of the abdominal cavity. The woman recovered. Further reference is made to the case in the chapter on Salpingo-oöphoritis.—P. F. M.]

Consequences of Posterior Displacements.—The post-uterine peritoneal space being much more extensive than the anterior, these proceed to a more aggravated degree than anterior displacements. The body sometimes descends to the upper extremity of the vagina, and instances are recorded by Rokitansky and Scott in which it penetrated the walls of the rectum and vagina and forced itself into these canals. This, of course, is a very rare occurrence, but it is worthy of mention as showing how great is the pressure which a retroflexed uterus may exert. The ordinary consequences of the affection are—

Dysmenorrhœa;
Endometritis;
Sterility;
Areolar hyperplasia.

Should pregnancy occur during the existence of this deviation, or retroflexion complicate pregnancy, and the fundus be incarcerated below the promontory of the sacrum, abortion will result. This cause of that accident is so very common that it should be suspected and examined for in every case of habitual abortion. Sterility is not so common a result of retro-positions as of anterior distortions. Winckel gives the following figures: In ante-deviations 28 per cent. were sterile; the proportion of births was 2.6 per cent., and abortions occurred in 22 per cent. In retro-positions, sterility only in 10 per cent.; 3.7 to 4 per cent. of births; and only 9.4 per cent. of abortions.

Frequency.—As a rule, retro-positions are more frequent in women who have had children than in virgins or nulliparous women. This, it will be remembered, is the reverse from anterior distortions and displacements.

Winckel[1] found in over 600 cadavers 4.3 per cent. of retroversions and 5.7 per cent. of retroflexions, or exactly 10 per cent. of all retro-positions. Schultze found an average of 10 per cent. of retroversions and 17.2 of retroflexions in his own practice, or more than double the percentage of Winckel. But Schultze's percentage is taken from patients who consulted him for some form or other of pelvic disease, and therefore more correctly expresses the proportion of retro-displacements in gynecological cases.

Mundé[2] found 403 retro-positions (348 retroversions and 55 retroflexions) among 2500 patients with uterine diseases, or about 16 per cent. Winckel, at another point, gives 19 per cent. of 3061, and later 16 per cent. of 5665 patients, as the proportion in his own practice. Therefore, from 16 to 20 per cent. may be fairly assumed as about the correct proportion of retro-displacements among gynecological cases.

Of all posterior displacements, only about 10 per cent. occur in virgins and nulliparæ (Winckel).

Prognosis.—There are three conditions which render the prognosis of this displacement unfavorable: where the uterus is bound down by strong adhesions; where the organ contains in its parenchyma a fibrous tumor; and where the vagina is attached to the cervix so near the external os that no pessary can rest posterior to the cervix to sustain the uterus after it is replaced. This form of utero-vaginal junction is important as giving ground for a very grave prognosis as to the cure of all anterior and posterior displacements.

Treatment.—The first indication is to restore the uterus to its place, the second to prevent its again becoming displaced.

Methods of Reduction.—In an ordinary case, in which the uterus is not firmly held in retroversion by the surrounding parts, the patient should be placed on the left side as for an ordinary examination with Sims's speculum. The operator, then lubricating the index and middle finger of the right hand, introduces them, he standing at the patient's back and facing her head, and the palmar surfaces of the fingers being directed to the rectum. The body of the uterus is then lifted upon the tips of the fingers until it becomes erect; then their dorsal surfaces, which will really be the backs of the nails, are made to push the organ over into normal position. As the uterus becomes elevated the middle finger is still kept in the post-uterine space to maintain what is gained, while the index finger is carried in front of the cervix, and this part is by pressure forced back toward the sacrum. The middle finger is now likewise placed in front of the cervix, and by both fingers this part is forced toward the sacrum, and kept there for a short time. This method of replacing a uterus which has fallen backward is superior to any other that we know of. We would urge a trial of it exactly as here described, and will answer for its efficiency.

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[1] *Loc. cit.*

[2] *Loc. cit.*

But sometimes the uterus is irreducible by any but the most powerful methods. In such a case, the bladder and rectum having been evacuated and the clothing loosened, the patient is made to kneel upon a hard surface, and to place the sternum as closely as possible in contact with the plane which supports her. The practitioner, then lubricating two fingers of the right hand, carries them into the vagina and against the fundus. He then directs the patient to fill the chest with air and expel it completely. As she does so he forcibly elevates the fundus and restores it to its place. Should this plan fail, the buttocks should be still more elevated by placing cushions under the knees, and the attempt repeated with two fingers in the rectum instead of in the vagina.

Should these powerful and usually efficient methods fail, we would strongly urge against efforts being made by introduction into the uterus of instruments for restitution. If they exert less force, they will not be effectual: if more, they may penetrate the uterus and create peritonitis. Besides, in a case resisting the plan detailed there will probably be found to be adhesions as the source of the difficulty. Under these circumstances Kuechenmeister[1] has, from extended experience, advised the introduction of the colpeurynter filled with water every day for as long a time as the patient can bear it. Steady hydrostatic pressure often in this way accomplishes safely what sudden force would do with danger to the patient.

In cases requiring the application of much less force Sims's repositor is an excellent instrument for the purpose, and should be employed. This instrument, which is represented by Fig. 208, consists of a short metal sound terminating in a ball. The ball is clasped by a straight shaft, moves upon a pivot running through its centre, and is perforated by seven holes. Through the shaft runs a rod which is projected by a concealed spring that is governed by the finger passed through the ring. The ball can be made to revolve, so that the sound describes a half circle, by withdrawing the stop-rod which runs through the shaft and depressing the instrument.

In many instances reposition is perfectly practicable by conjoined manipulation or rectal taxis, or by means of a sponge fixed in a sponge-holder and pressed into the fornix vaginæ. In replacing a uterus in this or any other malposition the operator should never forget that inflammatory action may have caused an effusion of lymph around it which resists its removal, and that if these adhesions be violently ruptured peritonitis may result.

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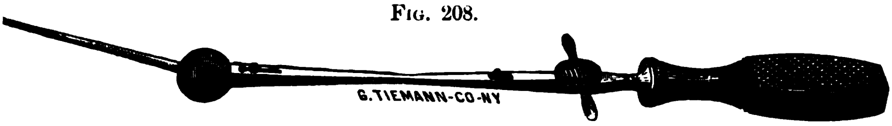
[1] *Am. Journ. Med. Sci.*, July, 1870, p. 275.

FIG. 208.



Sims's Uterine Repositor.

As early as 1820, Von Ritgen of Giessen recommended the knee-chest position for the automatic replacement of the retroflexed womb, and since his time the method has been often resorted to as an adjuvant to replacement. To Dr. H. F. Campbell, however, belongs the credit of systematizing it as a method of "pneumatic self-replacement," and putting it at the disposal of the gynecologist for daily use. "Camp-

FIG. 209.

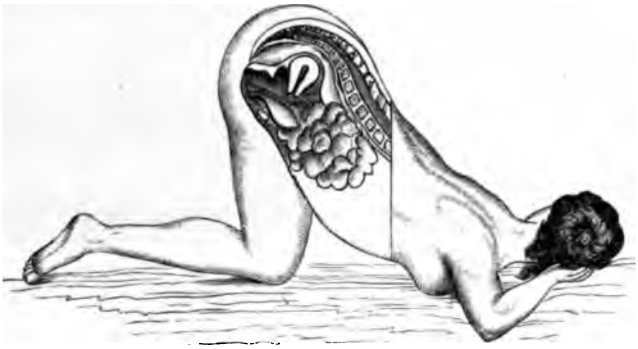
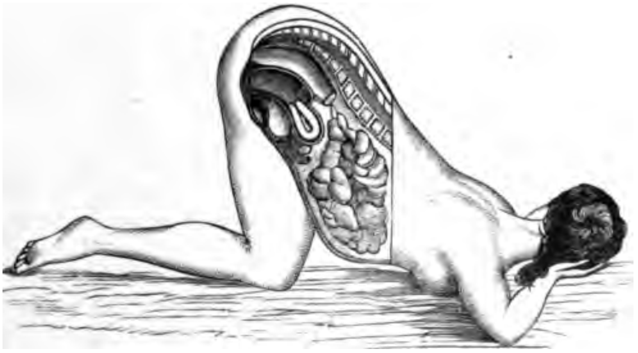


FIG. 210.



The Genu-pectoral Position, showing its Action in Retroversion.

bell's method" never does harm, generally effects great good as an adjuvant to other treatment, and in rare cases proves in itself sufficient for complete relief. It consists simply in the reversal of gravity by placing the patient in the attitude represented in Figs. 209 and 210, an examination of which will at once show the action of the method upon intestines and uterus. Dr. Campbell likewise directs that a small glass tube, about as large as the largest sized test-tube, should be introduced into the vagina by the patient while in the "genu-pectoral" position, to secure the admission of air and its action as a repositor.

During the treatment of all uterine displacements, except inversion and irreducible flexion, the patient may with advantage be directed to practise this automatic method of replacement for five or ten minutes upon retiring at night and upon rising in the morning. If a pessary be worn, it will be by this plan relieved of much of the pressure which it bears, congestion of the pelvic viscera will be lessened, and the organs of the abdomen, being displaced upward, will not immediately descend and depress those of the pelvis.

After replacement has been effected by any one of these methods the sound may be employed to make sure of its thoroughness and to increase it. It should never be used for this purpose before manual replacement, and even after it, it should be employed very cautiously and by the following steps:

1st. It should be introduced, but slightly bent, to the fundus.

2d. Holding the handle in his left hand, the operator should place the tips of the fingers of the right hand upon the shaft and carry it toward the perineum as far as possible.

3d. The uterus being now, to a certain degree, straightened and elevated, the sound should be rotated so as to throw the fundus forward, and the handle of the instrument held in one hand be carried toward the patient's back, so as to advance the tip as far as possible toward the abdominal walls.

Reading a procedure thus described often leaves the impression that it is a complicated one, and perhaps that the directions given are unimportant. Let one who has habitually used the sound simply as a rotator fairly try this more delicate and rational employment of it, and we are sure that he will adhere to it, even although prejudiced against it originally.

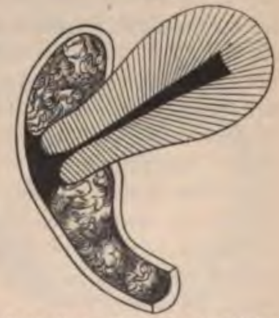
Sims's repositor likewise answers a good purpose in rendering replacement complete after partial replacement by the fingers.

Means for Retaining the Uterus in Position.—Having replaced the uterus, the question which arises is, How are we to prevent the recurrence of displacement at a very early period? Careful attention should immediately be paid to the following points: 1, all pressure from above should be removed by the use of the skirt supporter, the abdominal supporter, and avoidance of injurious muscular efforts; 2, increased weight of the uterus should be diminished by the adoption of means already pointed out for the fulfilment of this indication; 3, feebleness of the uterine supports should be remedied by exercises calculated to develop the retentive powers of the abdomen and by general and local tonics; and 4, all traction upon the uterus should be removed by perineorrhaphy or this combined with colporrhaphy. The fulfilment of one or of all these indications may at once bring relief to a case in which less radical and more desultory efforts might be indefinitely prolonged with only partial benefit. As the means for fulfilling these indications have been already fully pointed out, we shall not repeat them here.

All causes which originally excited and still perpetuate the accident having been as far as possible combated, the chief and most immediate indications are clearly to replace the displaced uterine body and to keep it in position.

For the purpose of fully exhibiting the method of treating a chronic case of this disorder, we will suppose that we are dealing with one of rebellious character, in which there is considerable tenderness about the uterus, so that it will not tolerate the pressure of a pessary sufficiently powerful to keep it in position. The bowels should be evacuated; the vagina thoroughly syringed with hot water night and morning; all weight taken from the abdomen by a skirt supporter, an abdominal supporter, and avoidance of all muscular efforts; and the uterus be replaced and held in the condition of complete anteversion for two or three minutes once in every forty-eight hours, for a week or more. As an additional preparation for the permanent support of the displaced organ a tampon of carbolized cotton should be applied in the following way: The uterus being pushed into a state of complete anteversion, a roll of cotton about the size of a small hen's egg, or an egg-sponge moistened with boro-glyceride or carbolized glycerin, should be carefully pushed as far as it will go into the fornix vaginæ. Then a large roll of cotton should be placed below the cervix and a little anterior to it (not behind it, as the first one was), but so arranged as to lift this part up into the hollow of the sacrum against the roll, which has now become invisible, in the fornix vaginæ. The subcervical tampon not only pushes back the cervix which was before its introduction near the symphysis pubis, but it still further elevates the supracervical roll, which thus pushes the fundus farther and farther upward until it topples over forward by its own weight, uninterfered with as it is by pressure from above and aided by the abdominal decubitus which should be observed by the patient. The accompanying diagram will explain the action of these two portions of the tampon *when properly applied*. If, instead of being thus inserted, the ordinary tampon be employed and the lower portion of the vagina be filled, nothing is accomplished but elevation of the retroverted organ. What we desire to produce is anteversion. After the introduction of the cervical pad, as shown in the figure, the vagina is filled with cotton to keep this in place, as well as to elevate the whole uterus and bring gravitation to our aid in throwing the body forward. We do not look upon the abdominal decubitus as a valuable resource in the treatment of retroversion, but merely as an adjuvant to other means

FIG. 211.



Retention of previously Retroverted Uterus in Normal Position by Tampons.

which directly straighten the axis of the uterus. Lift the retroverted organ, and it has a certain degree of efficacy as an adjuvant which it does not possess while the displacement is in existence. The tampon may be retained for forty-eight hours without inconvenience if the material of which it is composed be properly prepared by means of antiseptic drugs.

Cotton impregnated with antiseptic and alterative substances, such as borax, carbolic and salicylic acids, zinc, copper, alum, iron, etc., may now readily be obtained from druggists, so that the physician need not charge himself with its preparation.

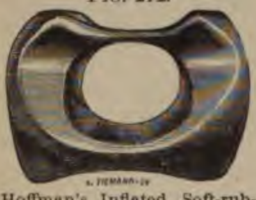
Prepared sheep's wool, being more elastic and less liable to cake, forms a desirable substitute for absorbent cotton.

During the use of this means the patient may go about and attend to her usual avocations, although sometimes it is better to confine her to bed.

We sometimes effect the same result by introducing a Hoffman's or Hurd's inflated rubber pessary, and then placing under this a tampon which will press it firmly up against the displaced fundus.

Should the residence of the patient be out of the city or her pecuniary condition render it impossible for her to be treated as here advised, the plan may be imitated by one which is very effectual, and much less troublesome to patient and physician. The uterus being thrown into anteversion by the repositor, or two fingers introduced into the fornix while the patient is in the left lateral position, a sponge pessary, which consists in the attachment of a soft egg-sponge, instead of a bulb, to the stem of Cutter's pessary (Fig. 220), should be left in position. The sponge fits in the vaginal cul-de-sac, is steadily pushed upward against the uterus by the elastic dorsal strap, and forcibly but gently keeps the organ in normal position. For such cases as those just indicated, and for others in which the retroversion is so obstinate that it recurs in spite of a pessary passed entirely into the vagina, this constitutes a means of such great value that we urge its trial in all difficult cases. By it we have controlled many cases which had resisted all other plans of mechanical treatment, and feel assured that it will not fail to produce in the hands of others as good results as it has yielded us. Of course it is only a temporary and preparatory means, for sponge is at all times an objectionable substance to leave in the vagina. It should in this case be removed, washed, and replaced by the patient once in every twelve hours.

FIG. 212.



Hoffman's Inflated, Soft-rubber Pessary.

After the methods thus far described have been pursued for a month or two, even the worst cases will generally tolerate a well-adjusted permanent pessary; but where this tolerance is not established, the medicated tampon or sponge pessary should be continued until it becomes so.

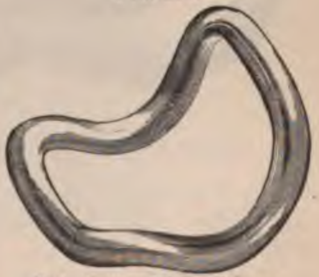
Better than the sponge pessary, if procurable, is a spring pessary covered with soft rubber, the post-cervical part of which is inflated and represents an air-cushion. It, like all other soft-rubber pessaries, should be removed and cleansed about once a week to prevent its becoming offensive.

One important point in connection with this method of replacing the uterus is this. The round ligaments are attached to the horns of the organ and at the vulva. If the retroverted or retroflexed uterus be left in malposition and simply pushed up, the ligaments will inevitably increase and ensure the continuance of the displacement. If, on the other hand, the body be thrown forward and kept in anterior position until the organ be lifted, the round ligaments, becoming tense, tend to act remedially on posterior deviations. A little thought will convince the reader of the truth of this statement. It is upon this action of the round ligaments that we in part depend for the benefit of the plan which we are describing.

It may be asked whether we propose to treat all cases of retroversion in this manner in the beginning. By no means so. We prefaced these remarks upon preparatory treatment by stating that we supposed the practitioner to be dealing with an aggravated case and one intolerant of support. Most cases will at once admit of the use of a retroversion pessary, and require no preparatory treatment. There are, however, many others which do require it, and in which immediate resort to artificial support proves injudicious and even dangerous. Some may suppose that a great deal of time must be consumed by this preparatory treatment which is not absolutely necessary for the relief of the case. If preparatory treatment be not necessary, it should not be resorted to; if it be necessary, time will be gained and not lost by its adoption. At least let us urge this advice: when the most carefully adjusted pessaries create discomfort, let a month be devoted to the preparatory treatment which we have described, and at its end let pessaries be again tried. Many cases will then be found to yield to mechanical treatment which were rebellious to it before, and more certainly so if the means recommended for removing pressure upon the fundus from above be faithfully put in practice. Some of the most gratifying results of gynecology will be found to arise from a cautious, patient, and philosophical treatment of these cases. But let no one suppose that a careless fulfilment of the directions given is likely to perform all this. If the plan which we are urging be used unintelligently and roughly, it will do harm and not good, and result in annoyance and not comfort to the patient.

It has now been decided, we will suppose, to try the effects of a retroversion pessary. Which of the many varieties at our command shall be selected? The oldest and most generally known of these instruments, Hodge's pessary, still holds its place in professional esteem, and is shown in Fig. 213.

FIG. 213.

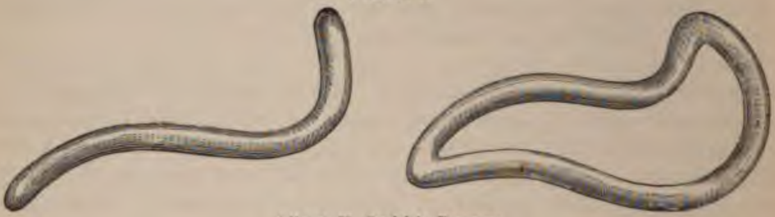


Hodge's Closed Lever Pessary.

To Hodge's pessary there are two objections: one is that it lacks a point of resistance at the outlet of the pelvis, which prevents it from turning around; the other is that it does not carry the body of the uterus high enough up in some cases. These defects Dr. Albert H. Smith has well met in the modification of Hodge's instrument which is shown in Fig. 214.

We likewise very commonly employ, in cases in which we desire to carry the retroflexed fundus very high in the pelvis, the instrument shown in Fig. 215.

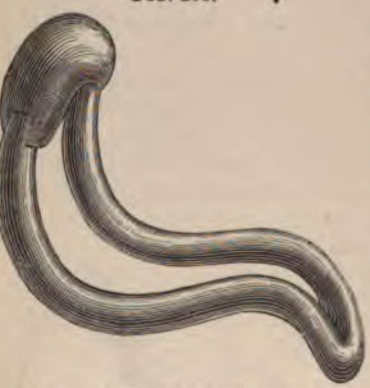
FIG. 214.



Albert H. Smith's Pessary.

It is a long and narrow instrument, surmounted at its upper extremity by a bulb, and measures between its branches at the widest part seven-eighths of an inch in the smallest sizes, and one and one-eighth of an inch in the largest; upon its upper extremity is a bulb which prevents cutting of the tissues; its lower extremity rests against the tissues under the pubes; and it is five inches long in the largest sizes and four and a quarter in the smallest, measured along the outside curve of the branches. Spanning the pelvis, this narrow instrument stretches the vagina without distending it, and pushes the fundus to a higher point than any other with which we are familiar. Its retention depends not upon its size, but its relation to the pelvis, for it is prevented from escaping not by separation of its branches, but by the length and degree of the post-uterine curve, and by the retention established by the tissues under the pubes against the downward curved lower extremity.

FIG. 215.



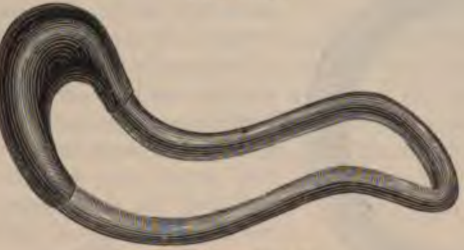
Thomas's Retroflexion Pessary.

The same instrument is also very cleverly made by Mr. Otto of New York of elastic spiral wire, covered with soft rubber and ending in a soft-rubber cushion or bulb at its upper extremity, as shown in Fig. 216.

The different varieties of the lever pessary (Figs. 213–216) can be inserted, after the reposition of the uterus, with the patient in the dorsal position, but much better and easier when she lies on her left side

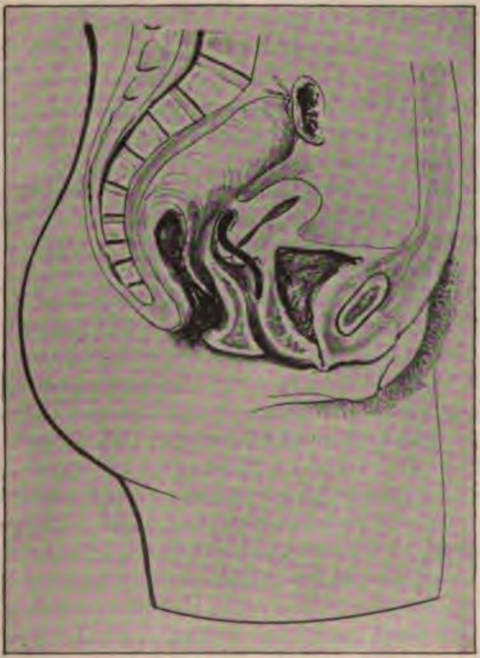
(Sims's position), when the pessary is introduced inverted into the anterior vaginal pouch, and by a quick motion of the right index finger is turned and drawn behind the cervix. This manœuvre is difficult to describe, but can easily be understood by demonstration on the subject. A detailed description of the methods of choosing and inserting the numerous varieties of vaginal pessaries now in use, with all the minutiæ attending their employment, will be found in Mundé's *Minor Surgical Gynecology*, pp. 350–398.

FIG. 216.



Elastic Bulb Pessary.

FIG. 217.

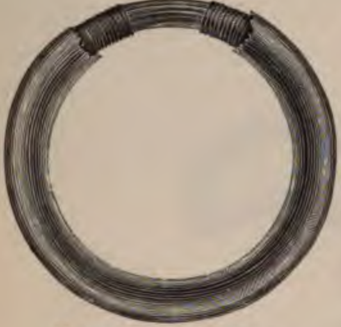


Showing Lever Pessary in Position.

To a limited degree support may in these cases be obtained by the elastic ring pessary of Meigs, which has been as variously altered as the lever of Hodge, but this instrument in posterior and anterior displacements is only palliative and imperfect in mechanism.

Nevertheless, this ring, imperfect as it is, cannot be discarded by the gynecologist, for in some cases it answers a purpose which no other instrument can be made to do. To one unaccustomed to the use of pessaries the simplicity and elasticity of this instrument will prove very seductive, and lead to a belief in its perfect harmlessness. Such a reliance will prove utterly delusive. Even the most elastic instrument will often cut through the vaginal walls when it is a little too large. It is indeed more liable to produce this result than any other variety of pessary.

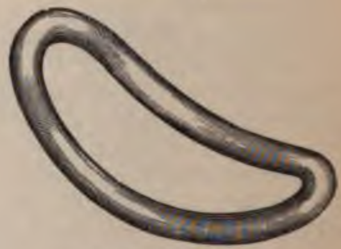
FIG. 218.



Meigs's Elastic Ring Pessary.

These are the instruments which we employ in ordinary cases of posterior displacement of the uterus. There are other varieties, however, which often answer an excellent purpose. Hewitt's pessary is an excellent one if the weight to be sustained be slight. If it be at all great, this instrument is utterly inadequate to cope with it. It is not simply inefficient; it is in such cases a dangerous instrument, for, resting against the soft parts covering the symphysis pubis, it may, as we have seen it do, cut directly through.

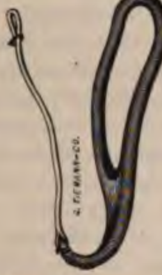
FIG. 219.



Hewitt's Pessary.

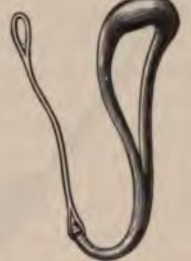
In a certain number of cases the displaced uterine body is so heavy and presses so forcibly downward that a pessary of ordinary size is driven out of the vagina or so low down as to allow descent of the fundus. This might be obviated by employing an instrument of large size and great expansion of limbs, but this the vagina cannot tolerate. It sets up ulceration and creates pain from pressure and distension. In other words, without a very firm base the uterus forces out the instrument; with a sufficiently firm base to resist this, ulceration from excessive pressure results. In some cases, indeed, so very great is the pressure exerted by the displaced uterus that no purely internal support will answer the purpose of sustaining it, for the point against which either the pubic or uterine extremity of the instrument rests will, in spite of every precaution, become ulcerated. Under these circumstances we have obtained the most gratifying results from the use of a modification of Cutter's retroversion pessary, intended to obviate a difficulty which we found attended that excellent instrument—that of cutting into the vagina. If no great amount of pressure is to be borne, Cutter's pessary answers very well for this purpose; if great pressure is to be borne, the point of his instrument endangers the tissues. For this reason we have affixed to the top of Cutter's pessary bulbs of different sizes—some as large as an olive—for the object is not only to prevent cutting of the vagina, but to place behind the displaced fundus a mass which will make it fall forward by *displacement*, and not by pressure. Our alteration of this instrument is insignificant; the entire credit of it belongs to Dr. Cutter, to whom the profession is indebted for affording it so valuable and simple a method for meeting the difficulties of aggravated retroversion. Had we space we could cite a number of very bad cases of this difficulty which had for years resisted treatment by ordinary pessaries, and which have readily yielded to the use of Cutter's instrument or this modification of it. The inferior extremity of this pessary arches backward over the coccyx, and attaches to an elastic cord which passes upward over the sacrum to a girdle around the waist. It is a painless and efficient method of giving support, and will gain a high reputation on account of these qualities in posterior displacements. The class of cases to which it is especially applicable is that in which the displacement is due to prolapse of the posterior vaginal wall from rupture of the perineum or other cause. When employed for posterior displacements, the upper extremity of the instrument simply lies in the fornix vaginæ, the cervix of course not entering the fenestra.

FIG. 220.



Cutter's Pessary.

FIG. 221.

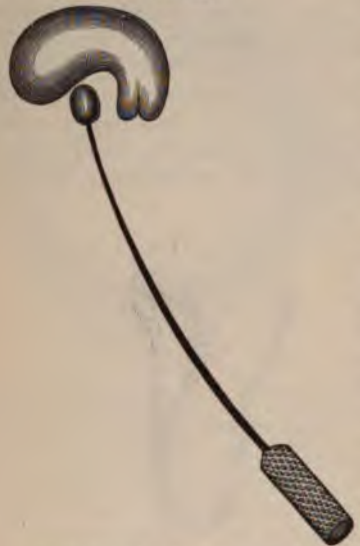


Thomas's Modification of Cutter's Pessary.

This instrument should be removed every night and reinserted every morning. It may be said that this will prove difficult of accomplishment for the patient. Out of hundreds of cases in which we have used it we have never found an instance of failure in this respect. The patient will very often become disaffected toward the instrument from its chafing the perineum. By a little patience, covering the points which rub with greased lint, and leaving the pessary out until the irritated part be healed, the feeling will soon pass away.

It will be observed that thus far we have dealt, in treating of the mechanical means for sustaining the flexed uterine body, with those which directly push the fundus upward, in the hope that in time it will fall forward of its own weight and assume a natural position. In some cases this is not enough; we are forced to do that at the same time that we elevate as far as possible the cervix into the hollow of the sacrum, and thus increase the liability of the uterine body to fall forward. In other words, there are two forces which may, through a pessary, overcome retroflexion: first, that which pushes the corpus uteri upward and forward; second, that which pushes the cervix upward and backward. The first of these often proves quite sufficient without the second, but sometimes the direct and steady pressure upon the uterine body involved in it becomes intolerable. Then is it that the second, which alone is never sufficient, comes into play as an efficient adjuvant. We have often seen the practice of the double method effect cures which seemed to have been impossible by that of a single one. We deem this point of sufficient importance to illustrate it by schematic diagrams.

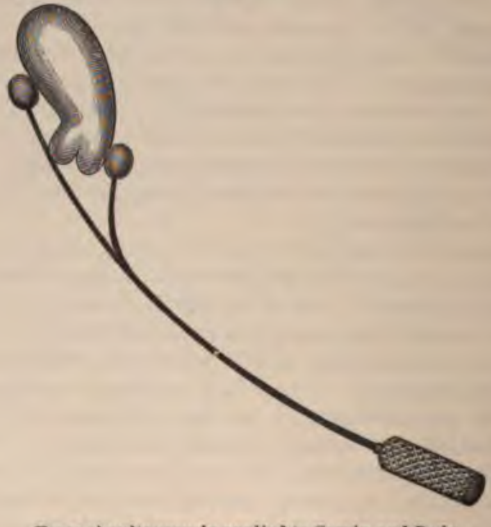
FIG. 222.



Force applied to Uterine Body alone.

By these means a uterus affected by a reducible retroflexion may, in all conditions excepting the unfavorable ones already mentioned, be restored to its place and kept

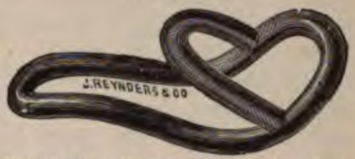
FIG. 223.



Force simultaneously applied to Cervix and Body.

there without resort to the intra-uterine stem or a cutting operation. These unfavorable conditions we will now consider.

FIG. 224.



Retroflexion Pessary with Cervical Rest.

When the vagina unites itself to the cervix so near its lowest point as to leave almost no post-cervical space, it is impossible to sustain the uterus by any vaginal pessary. Under these circumstances, and these alone, we believe the intra-uterine stem to be necessary in posterior displacement. Those which were recommended in anteflexion will answer here.

Anteflexion is probably often a congenital condition, or continues for so long a period during the life of the girl before it is discovered that the anterior inflexion becomes an irreducible uterine deformity, This is sometimes—though much less frequently so in retroflexion. which is usually reducible unless the flexed body be bound down by false membranes—the result of slight peritonitis. It is sometimes difficult in a given case to decide the cause of the permanency of the displacement. In a general way it may be said that if it be due to false membranous attachment, the uterus will not move from its position in the pelvis; if it be due to contraction in the tissue of the uterus itself, the organ will change its pelvic relations, but not the abnormal ones existing between body and neck.

In case the flexion be found due to parenchymatous alteration, no surgical procedure should be adopted; but the body should be cautiously bent forward once or twice a week by means of the sound or repositor, and kept in anterior inclination by means of the retroflexion pessary shown in Fig. 224 or by the modified Cutter's pessary.

If the uterus be found fixed in the position of retroflexion by false membranous attachments not of recent origin, and the patient be not suffering to such an extent from the displacement as to render reposition urgently necessary, it had better be left undisturbed in its unnatural place. Should the disorder, however, be affecting the health or causing such pain and discomfort as to render the incurring of the risk of peritonitis warrantable, reduction should be accomplished in this way: The patient having been anæsthetized and placed in the left lateral position, the sphincter ani should be stretched by the thumbs. Then the index and middle fingers of the right hand should be passed, with the palmar surfaces toward the sacrum, up the rectum to the flexed uterine body. Steady pressure should then be made upon it until the organ is lifted upright, when, the fingers being made to describe the arc of a circle toward the pubes, the outer surfaces of the finger-nails will be in contact with the uterine body, and by them it will be pushed over into an anterior position. After this the fornix should be filled with a soft, moist sponge, and this be forced up so as to sustain the body by a tampon of cotton in the vagina. After this the patient should be kept very quiet for a week, and all pain should be soothed by free use of opium as a preventive of peritonitis.

Schultze[1] has especially recommended the bimanual detachment under anæsthesia of the retroverted, displaced, and adherent corpus uteri. We have practised this method a number of times with fair success, but think it practicable only when the adhesions are either fresh or trifling in extent.

In cases where the body of the uterus and the appendages are both adherent, and the symptoms (pain, dysmenorrhœa, sterility) urgently call for relief, of late years the proposal has been made by Olshausen, Sänger, Kelly, and others, and followed by the majority of other laparotomists, to open the abdominal cavity in the usual way, and by the fingers, introduced through the opening, peel loose the adherent uterus and appendages, and stitch the fundus uteri to the anterior abdominal wall. This operation has been called "ventro-fixation," "abdominal hysteropexy," and "hysterorrhaphy" by its various advocates. It is evident that the dangers always and inevitably accompanying an abdominal section (peritonitis, septicæmia, intestinal obstruction) are necessarily attached to this operation. Hence it should not be performed lightly or carelessly. We have done it a number of times, with very good results (one subsequent pregnancy with abortion at four months.—P. F. M.), but feel somewhat inclined to limit it to those cases where the diseased ovaries and tubes form the chief indication for the operation, the backward displacement being of secondary importance. Here we not only stitch the fundus uteri, scraped raw with the knife, but also the pedicles of the appendages, to the anterior abdominal wall.

For cases of retro-displacement which proved intractable to the forms of support described above, and still called for relief, Alexander[2] of Liverpool in 1881 revived an operation previously hinted at by Aran and Alquié in France, Freund in Germany, and Adams in England, consisting in opening the inguinal canal on each side of the pubis, catching up and drawing out the round ligaments until the fundus uteri touches the anterior abdominal wall, sewing the ligaments firmly into the canal, and cutting off their excess. The uterus is supported by a vaginal pessary for some months, until the ligaments are firmly attached in their new relations. We (P. F. M.) have performed this operation nearly forty times (first in 1884), and believe in its usefulness and permanent results most decidedly. Several of our patients have even conceived, carried to term, and been delivered without the uterus again retroverting. Be it understood that this operation does not conflict with that of ventro-fixation, since Alexander's operation is indicated only when the uterus is freely movable and the appendages are normal. One objection to it is the uncertainty of finding the round ligaments sufficiently strong to support the elevated uterus. For details as to the technique see Alexander's book and Mundé.[3]

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[1] Schultze, *loc. cit.*

[2] Alexander, *The Treatment of Backward Displacements of the Uterus and of Prolapsus Uteri by the New Method of Shortening the Round Ligaments*, London, 1884.

[3] Mundé, "The Value of Alexander's Operation, estimated from the results of 23 cases," *Am. Journ. Obst.*, Oct., 1888.

Latero-flexion.

Sometimes the uterus is flexed to the right or left side as a consequence of disease of its proper tissue or of direct pressure. This variety of displacement rarely attains to such a degree, however, as to result in obstruction of the uterine canal. Its chief importance is connected with diagnosis, for it may readily be mistaken for peri-uterine inflammation or a fibrous tumor. The practice of conjoined manipulation and the use of the uterine probe will always settle the point.

The treatment of latero-flexion should be conducted upon precisely the same principles which guide us in reference to anteflexion and retroflexion. Of all varieties of flexion, this is the most likely to require the use of the intra-uterine stem, for it is exceedingly difficult—we may even say rarely possible—to overcome it by a vaginal instrument. When this necessity presents itself, either in retroflexion or latero-flexion, we employ the intra-uterine stem represented in Fig. 200. The fundus is in part sustained by the pessary, not entirely by the stem.

After the introduction of every pessary the position of the uterine body should be at once examined, either by the probe, by conjoined manipulation, or by both, to ascertain whether the instrument be efficient or not. If it be not so, it is imperfect, for the object is not to go through the form of introducing a pessary; it is to rectify the malposition of the uterus. At the next and at every subsequent visit of the patient this examination should be made before removal of the instrument, in order to test the effect of time and movement upon the position of the supported uterus.

CHAPTER XXXI.

INVERSION OF THE UTERUS.

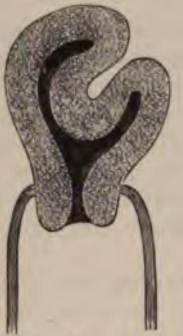
Definition.—This dangerous and infrequent form of displacement consists in the turning of the uterus inside out. As the bottom of a bag may be pushed through its mouth, so that the inner surface becomes the outer, so may that of the uterus, and the occurrence of such an accident constitutes the disease which we are considering.

Varieties.—Writers differ in classifying the varieties of the affection, some describing three and some four forms. For practical purposes all these may be brought under two heads—partial and complete. In the first the body has become depressed, but has not passed through the os. In the second the uterus has been turned completely inside out, and the inverted fundus and body hang in the vagina or, if the vagina also is inverted, between the thighs—"*velut scrotum*," as it has been expressed by Hippocrates. Fig. 225 represents the first, and Fig. 226 the second form of the accident.

In addition to these varieties the accident must be divided into acute and chronic, or sudden and gradual inversion, as it occurs rapidly or slowly.

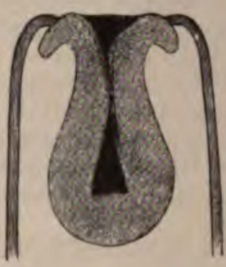
Anatomy.—In treating of flexions of the uterus it was remarked that they are chiefly prevented by the resisting nature of the parenchyma of the cervix which supports the fundus and body. A similar function on the part of the entire uterine structure keeps the cavities of the neck and body closed and prevents inversion. Should that power which in the pregnant uterus we call contractility, and in the non-pregnant tone, be to any great degree impaired, the body of the organ, bereft of support, will incline forward or backward. Should it be entirely abolished, the fundus under the influence of traction or downward pressure may pass through the unresisting os and escape into the vagina, constituting inversion.

FIG. 225.



Partial Inversion.

FIG. 226.



Complete Inversion.

[I once saw this perfectly illustrated in a cadaver upon which I was called to perform version soon after death. As I extracted the child the flaccid uterus followed it directly, and was completely inverted, the placenta still adhering.—T. G. T.]

[I also saw this occur during the past winter while evolving by traction a sessile fibroid attached to the fundus uteri; the whole organ was inverted, with the vagina, and lay outside the vulva, with the tumor still attached to the fundus. After enucleating the tumor I manually reinverted the uterus.

Winckel[1] says: "I am not aware of any recorded case in which inversion had been observed to follow traction used in extracting a polypus in the same way as it may be caused by traction on the umbilical cord. This is improbable, as in such cases the polyp is seldom larger than a hen's egg and the pedicle usually thin." I am surprised at this statement, for I have seen partial inversion produced a number of times, indeed usually, when traction was required to render the pedicle of the polypus accessible, and in the above case the inversion was complete, and I had some difficulty in restoring the organ.—P. F. M.]

Pathology.—The accident depends for its production upon two elements—

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[1] *Loc. cit.*, p. 335.

1st. Relaxation and inertia of the uterine walls;

2d. Downward traction or pressure.

The first of these may be a primary and original state, or it may be induced by the second after months of exhausting action. For example, after labor the uterine walls may remain lax and atonic from inherent inertia; or their tissue in the non-pregnant state may be firm and resisting, yet in time be overcome by the traction and dilatation exerted by a large fibrous polypus attached to the fundus.

In the limited space which we can allot to this subject it is impossible to present the various theories which have been advanced for the explanation of the mechanism of inversion, nor would it be beneficial for the student that we should do so. In place of such an effort we shall mention those which appear to us to possess really important and practical bearing upon the subject.

The three views to which we shall direct attention are the following:

1st. That some part of the relaxed body prolapses, and, passing out of the cervix, drags the entire uterine body with it.

2d. That some part of the relaxed body, prolapsing, acts as an excitant of uterine contraction, which forces the remaining portion through the cervix, and thus inverts the whole organ.

3d. That lateral traction and direct pressure on a cervix the tissue of which is abnormally soft causes eversion of this part and gradually of the whole uterus.

The first of these is the oldest, and even at present the most generally received, view as to the mechanism of inversion. According to it, it was generally supposed that the part of the fundus which first undergoes inversion is the middle. This is denied by Oldham and Kiwisch, who maintain that one horn first inverts itself, and is followed by the fundus, the other horn, and then the entire body.

[I have met with one case which proves incontestably that, even if this be not a rule, inversion at least occurs in this manner sometimes. A patient who for several years had suffered from menorrhagia applied to Prof. C. A. Budd of this city for treatment. Upon examination he discovered what he supposed to be a fibrous polypus equal in size to a hen's egg attached to the uterine cavity near the entrance of the right Fallopian tube. Carefully differentiating this, as he supposed, from partial inversion, he applied the écraseur and removed it, when he discovered that he had removed one horn of the uterus with a part of the corresponding Fallopian tube and round ligament. The case, which was one of partial inversion, was not susceptible of diagnosis. The menorrhagia attending it was entirely relieved by the operation, the patient rapidly recovering.—T. G. T.]

When the accident begins in this way the inverted horn pulls down the other parts with greater or less rapidity, and thus the method of occurrence may be lost sight of. Rokitansky, in speaking of irregular post-partum uterine contraction, thus describes partial inversion, with which he has twice met: "We must here mention a very singular circumstance which may, on account of the consequent danger, become important, and may even be misunderstood in post-mortem examinations: it is paralysis of the placental portion of the uterus occurring at the same time that the surrounding parts go through the ordinary processes of reduction. It induces a very peculiar appearance. The part which gave attachment to the placenta is forced into the cavity of the uterus by the contraction of the surrounding tissue, so as to project in the shape of a conical tumor, and a slight indentation is noticed at the corresponding point of the external uterine surface. The close resemblance of the paralyzed segment of the uterus to a fibrous polypus may easily induce a mistake in the diagnosis, and nothing but minute examination of the tissue can solve the question. The affection always causes hemorrhage, which lasts for several weeks after childbirth, and proves fatal by the consequent exhaustion."

Since the days of Astruc the theory has been at various times maintained that active contraction of the uterus sometimes produces inversion. "Sometimes," says Astruc, "it is produced from contraction of the womb, which forces the bottom inside out through the mouth of the womb, which is not yet closed." Regular uterine contraction, however violent it may be, would only tend to complete closure of the uterine cavity. If, however, such a partial inversion or internal projection as that alluded to by Rokitansky in the quotation recently made occur, it acts as the placenta, the hand of the obstetrician, or any other body in the cavity, by exciting expulsive efforts which may succeed in driving it out of the os externum. Should they do so, complete inversion is the result; should they fail, the projection may persist as a partial inversion. This view, which was advocated by the late Dr. Tyler Smith, appears to me to explain the apparent paradox of inversion with tonic contractions of the uterus, more satisfactorily than any other which has been advanced. We have met with one case occurring after delivery which convinces us that sometimes, at least, what we have just described really takes place.

Still another and very ingenious theory has been advanced by Prof. I. E. Taylor for explaining the occurrence of inversion. It is that inversion sometimes begins at the cervix, this part undergoing eversion as in prolapsus, and this going on to the complete inversion of the entire organ.

In previous literature allusions to the possibility of inversion after this method may be found. Klob alludes to it in these words: "A very remarkable class of cases of inversion are those in which, without efficient cause, an inversion of the cervix into the vagina takes place, drawing the fornix of the latter with it, and thus forming a polypus-like tumor in the cavity of the vagina, which may reach down to the vulva, at the lower part of which the internal orifice is situated." A very striking case was published by Mr. William Lawrence in the *London Medical Gazette*, Dec. 5, 1838, under the head of "Spontaneous Partial Inversion of the Uterus." But the credit of having drawn proper attention to the subject and having proclaimed its probable pathological bearings unquestionably belongs to Taylor. We say "probable," for the reason that it is not yet proved. We accept it, because our own observation leads us to believe that Dr. Taylor's deductions are probably correct.

The majority of non-puerperal inversions are undoubtedly produced gradually by the efforts of the uterus to expel a submucous tumor situated at some point above the internal os, preferably at the fundus. Scanzoni demonstrated this fact in an able and elaborate paper published in 1867.[1]

Predisposing Causes.—Every influence which destroys the tone and resistance of the uterine parenchyma proves a predisposing cause of this condition. As examples may be mentioned—

Parturition;
Distension of uterus by retained fluids;
Distension of uterus by tumors;
Spongy softening of tissue in prolapsus (?).

Exciting Causes.—A uterus in which the tone of the walls has been destroyed by physiological, pathological, or mechanical causes has lost all its normal safeguards against inversion. Thus, we may say that anything which produces distension and relaxation of the tissue of the uterus prepares the way for inversion so completely that a very trifing exciting cause may produce it. For example, any decided traction or pressure exerted upon the fundus of a uterus thus affected, even to a limited degree, may directly result in it. The exciting causes are thus presented:

Traction on placenta;
Traction by polypi or tumors;
Sudden delivery of child by traction;
Muscular efforts when relaxation exists;
Prolapsus uteri (?).

Instances of its production by all these causes are on record, though by far the greatest number of cases has followed parturition. Of 400 cases collected by Dr. Crosse of Norwich, England, 350 followed delivery, and of the remaining 50, 40 were due to polypi. This disproportionate frequency does not, however, invalidate the fact that the other causes mentioned have resulted and may result in the accident. Most frequently it occurs very soon after delivery, though Ané and Baudelocque report its having taken place on the third, and Leblanc on the tenth, day.

Traction and relaxation, when combined, are evidently sufficient for the induction of the accident, and it is generally to a union of the two that it is due. The question now arises whether either of them alone can cause it. With reference to the efficiency of the second element, the answer may be affirmative, since with complete relaxation inversion may occur from a very insignificant exciting cause, as coughing, sneezing, or a change of posture. As to the possibility of any amount of force inverting the non-pregnant and undilated uterus much doubt has been expressed. At first thought every one will feel inclined to express a decidedly negative opinion, but the evidence on record in favor of such a possibility is too strong to be entirely ignored. A portion of it is therefore laid before the reader.

Puzos[2] in 1744 read before the Academy of Medicine of Paris a memoir in which he declared that he had seen the accident in women who had never borne children. Boyer[3] cites a similar example in a female whose uterus contained no foreign body, and Daillez[1] tells us that Baudelocque met with a case in a girl fifteen years of age in whom clandestine delivery could not have occurred, since a perfect hymen existed.

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[1] Scanzoni's *Bertrüge*, 1867.

[2] Columbat on *Females*, Meigs, p. 182.

[3] *Traité des Mal. chirurgicales.*

It may, perhaps, not be ungracious to doubt the correctness of the diagnosis in these ancient cases, since recent literature gives us well-authenticated cases of inversion of the virgin uterus unaccompanied by the tractile force of a fibrous tumor. Winckel says (*loc. cit.*): "Polk has reported an inversion of the virgin uterus, but it is doubtful whether the diagnosis was really correct."

[Prof. Willard Parker of New York furnishes me with the history of the following case: A young woman who had borne one child seven or eight years previously, and had never had any recognized uterine disease, while making a violent effort in rolling tenpins suddenly felt something give way within her, after which she suffered the most intense pain and became completely disabled. Dr. Parker, being called to see her, after a hasty examination coincided with the opinion of the attending physician, that a polypus had been suddenly expelled and was hanging in the vagina. Impressed with this belief, he removed the whole mass, when, to his surprise, he found that he held in his hands the inverted uterus with its tubes and ligaments. The patient recovered without any bad symptoms, and subsequently menstruated regularly.—T. G. T.]

Menstruation after amputation of the uterus is by no means rare. It must be remembered that in such an operation the whole uterus is not removed. It is from the remaining stump that the flow occurs.

After all, there is nothing more astounding in the fact of spontaneous inversion of an undistended uterus than there is in the spontaneous reposition of one which has been long inverted; and this we have, with the positive testimony of scientific and reliable men now on record, no possible justification for doubting. Of late the validity of both these phenomena has been denied. There is nothing easier than the rejection of the testimony of others and the discrediting of deductions which we ourselves have not drawn. When De la Barre presented his case of spontaneous reposition to the Academy of Surgery, Baudelocque was appointed a committee to examine into it, and reported that it was "totally false." Some years afterward he met with a very similar case, and yielded to the evidence of his own senses a credence which he had presumptuously denied to the assertions of another. Spiegelberg reports a case of spontaneous reinversion while the patient was straining at stool.

Symptoms.—Should inversion occur suddenly—as, for instance, after delivery—the patient will complain of discomfort about the vulva, faintness, and nervous disturbance. Hemorrhage and tendency to collapse will show themselves, and unless proper treatment be adopted at an early period death may ensue. A physical examination will at once settle the diagnosis, for a large, flabby, globular mass, perhaps with the placenta attached to it, will be found between the thighs of the patient if inversion be complete. But very often no diagnosis will have been made at the time of its occurrence, and months, perhaps years, afterward the physician will be called upon to determine the character of the case, which will probably present the following symptoms:

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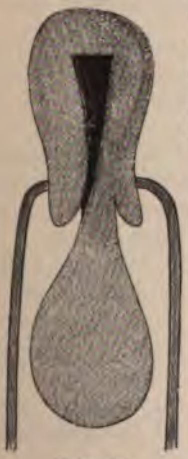
[1] Colombat, *op. cit.*

- Occasional or constant hemorrhage;
- Dragging pains in back and loins;
- Difficulty in locomotion;
- Difficulty in defecation and micturition;
- Anæmia and its accompanying evils.

Physical Signs.—All these symptoms belong as much to polypus, fibrous tumor, and cancer as to inversion, and to determine their true cause physical exploration is indispensable. Should the inversion be complete, the finger, being introduced into the vagina, will meet with a tumor, which the examiner will at once know is either the displaced body of the uterus or a polypus, and his attention will be directed to their differentiation.

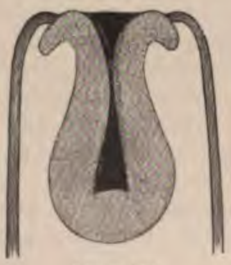
IF IT BE A POLYPUS—	IF IT BE INVERSION—
The probe will usually pass by its side into the uterus;	The probe will be arrested at the neck;
Conjoined manipulation will reveal the uterine body;	Conjoined manipulation will reveal a ring where the uterus should be;
Rectal examination will reveal the uterus *in sitû;*	Rectal examination will not reveal the uterus *in sitû;*
Recto-vesical exploration will reveal the uterus;	Recto-vesical exploration will not reveal the uterus;
Acupuncture will give no pain.[1]	Acupuncture will give pain.

Fig. 227.



Polypus.

Fig. 228.



Inversion.

In certain very rare cases a large fibrous tumor growing from one lip of the cervix will lead to the belief in inversion in the following manner: the pedicle setting up inflammation in the cervical canal, complete adhesion takes place, so that a probe can nowhere be passed. An examination of Fig. 227 will readily explain how such a state of things might arise and prove exceedingly perplexing. We have seen several such cases, in all of which recognition of the presence of the uterine body above emboldened us to work the probe through the tissue around the pedicle of the growth, causing it to enter the uterus and thus prove incontestably the nature of the case.

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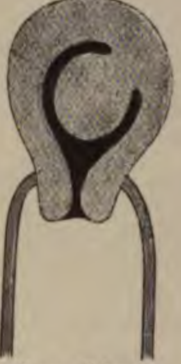
[1] Gueniot, *Arch. gén. de Méd.*, 1868, t. ii. p. 393: a doubtful sign.

Should the inversion be incomplete, diagnosis will always prove difficult, and in fat women particularly so. Differentiation from a fibrous tumor will depend upon the following signs:

IF IT BE A FIBROID GROWTH—	IF IT BE PARTIAL INVERSION—
The probe will show increase of uterine cavity;	The probe will show diminution of uterine cavity;
Conjoined manipulation per vaginam and rectum will reveal rotund body of uterus;	Conjoined manipulation per vaginam and rectum will reveal small abdominal ring;
It will have come on very gradually;	It will have occurred more suddenly;
It will have no reference to parturition;	It usually follows parturition;
Acupuncture is painless(?).	Acupuncture gives pain(?).

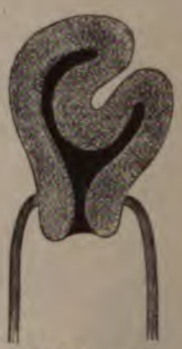
A partial inversion of a non-puerperal uterus, unattended by the presence of a fibrous polypus as the predisposing and exciting cause, does not occur, or at least is scarcely likely to come under observation.

Fig. 229.



Fibrous Polypus.

Fig. 230.



Partial Inversion.

It is only when the inversion has been completed that the symptoms induce the patient to seek medical advice. Hence in cases of partial inversion there will always be found a fibrous tumor forcing its way out of the uterus, and drawing the uterine wall after it.

Course, Duration, and Termination.—All these are very variable. The accident occurring after delivery may rapidly, unless relieved, produce death by hemorrhage and exhaustion; or it may continue for many years, giving very little annoyance; or, again, it may render the life of the patient miserable on account of hemorrhage and other attending smyptoms, and nevertheless last for years. As a rule, it may be stated that inversion continues until relieved by treatment, and yet even this is not without exceptions. The womb has been known under these circumstances to replace itself by its own contractions years after its occurrence when the accident has happened after delivery. Twelve such cases have now been placed upon record: three by Meigs,[1] and one by each of the following observers: Spiegelberg,[1] Leroux,[1] De la Barre,[1] Thatcher,[1] Rendu,[1] Shaw,[1] Baudelocque,[2] Foujen,[3] and Huckins.[4] Even admitting the undoubted authenticity of these cases, spontaneous reduction must be regarded only as a curiosity, and not as a process to be anticipated.

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[1] *Obstetrics.*

Prognosis.—The prognosis of chronic inversion is at all times grave. Repeated and prolonged hemorrhages prostrate the patient and expose her to all the risks of the worst forms of uterine polypus. But not only is she exposed to dangers inherent to the displacement from which she suffers; those attendant upon an erroneous diagnosis are very great. To one alive to the possibility of confounding the condition with fibrous polypus, the methods of differentiation are numerous and reliable; but to the rapid and careless diagnostician, who does not allow the possibility of error to enter his mind, and consequently does not carefully weigh the evidence, there is a great likelihood of it.

One who is aware of the great frequency with which amputation of the inverted uterus has been practised under the impression that a fibrous polypus was being removed, cannot but wonder that errors of diagnosis have so often occurred when so many methods of differentiation were at command. The explanation is that to which we have referred—namely, that the possibility of error was not entertained. Out of 58 cases of inversion of which a report is given in the *Beiträge zur Geburtskunde und Gynäkologie*, and in which amputation was practised, 7 were mistaken for polypi.

[I have treated personally 9 cases of inversion, of which 6 resulted from parturition and 3 from traction by sessile polypi. Of these, 7 were cured by replacement; 1, in the case of a very old and feeble woman, was left unreplaced, after removal of a sessile fibroid, which gave complete relief; and 1 case after replacement ended fatally from peritonitis.—T. G. T.]

Even where a correct diagnosis has been made, still another danger menaces the patient—that of rupture of the vagina in attempts at reduction of the inverted organ. A small hand, a cautious, unexcitable mind, and constant vigilance during all the efforts by taxis must be combined with thorough knowledge of the subject to avoid this imminent danger. Even with this combination it is a matter of surprise to us, from our experience with these cases, that the accident has not occurred much oftener. We confess that we should prefer to trust a patient in whom we felt great interest to the operation of abdominal section, which is hereafter described, than to that of prolonged taxis at the hands of a rough, unintelligent, and inexperienced practitioner. To one thinking upon this subject for the first time this position will appear exaggerated and indefensible, but we assume it after mature reflection.

When the prospect of returning the uterus seems brightest the practitioner is sometimes disappointed by the existence of adhesions. Thus Velpeau,[5] after the removal of a polypus attached to an inverted uterus, was completely foiled in restoring it, and the patient died from peritonitis.

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[1] Article by Prof. Spiegelberg in *Archiv für Gynäkologie*—*Am. Journ. Obstet.*, Aug., 1873.

[2] Daillez, *Thesis*.

[3] Weiss, *Des Réductions de l'Inversion, etc.*

[4] Letter to author from Dr. Jason Huckins of Maine, U. S.

[5] Becquerel, *op. cit.*, p. 306.

Treatment.—In the treatment of inversion three methods may be adopted:

1st. The organ may be left in malposition, hemorrhage being controlled by hemostatic means.

2d. The inversion may be reduced by taxis, by elastic vaginal pressure, or by a combination of the two.

3d. All these failing to give relief, the uterus may be amputated.

Methods of Checking Hemorrhage, the Uterus being Left in Situ.—Should the operator fail in repeated attempts at reduction, it becomes a question whether he should amputate the displaced organ or leave it in its abnormal position and endeavor to combat the evils resulting. The greatest of these is unquestionably hemorrhage, which steadily exhausts the patient: but others of less moment arise from dragging of the uterus upon its ligaments and the mechanical inconvenience of a tumor in the vagina. If the patient be near the menopause, both of these may diminish by atrophy and cessation of menstruation. Should she be young, artificial means may, in a limited degree, accomplish the same results.

The most vascular growths—such, for example, as hemorrhoids and nævi—may be diminished in size and rendered non-hemorrhagic by astringents or caustics, which destroy their superficial varicose vessels and leave a less vascular tissue beneath. The inverted uterus may be similarly acted upon, not only in checking hemorrhage, but in producing atrophy, and thus removing to a certain extent the two sources of suffering.

Solutions of alum, tannin, persulphate of iron, or acetate of lead may with advantage be injected into the vagina so as to bathe the uterus freely, or they may be placed in contact with it by means of pledgets of cotton. Should these fail in checking the flow, a plan proposed by Aran, of applying caustics to the whole bleeding surface, may be resorted to. The tumor being drawn down and exposed to view as much as possible, its surface is seared by the actual cautery or touched by potassa cum calce or the mineral acids. The organ, after being bathed in a neutralizing fluid, is then enveloped in lint, so as to protect the vaginal walls, and placed within the pelvis. We have never seen the method employed, but would not hesitate in an appropriate case to venture upon it. Aran declares that not only is hemorrhage checked by it, but great diminution of the tumor effected. The procedure recommends itself as eminently rational, and when it is remembered that the only recognized alternative is amputation, the propriety of giving it consideration must be admitted.

Many cases are on record in which the uterine mucous membrane has become altered so as to resemble skin, and in which the patients have lived without suffering for many years. Dr. Alexander H. Stevens had one case under observation for more than thirty years; Dr. Charles A. Lee diagnosticated one which had remained undetected for twenty-five years; and the works of older writers offer many other examples. If we can bring about a similar condition by artificial means and avoid the operation of ablation, we will certainly be acting in the best interests of the patient. It is for this purpose that cauterization offers itself as a resource.

Methods of Replacing the Uterus.—It is not certainly known whether the condition of inversion of the uterus was properly understood before the time of Ambrose Paré. Since his epoch it has been fully described by his successors, and all its pathological features, its various symptoms, and its manifold dangers have been thoroughly appreciated. From the time of Paré, who lived about the beginning of the seventeenth century, to our own, although great advances were made in the scientific department of the subject, very little was attained in the way of treatment. The possibility of replacing by taxis a uterus recently inverted was known, but for cases in which the organ had been displaced for years, or even for months, no resource existed except amputation.

It is certainly one of the many triumphs of which the gynecology of the nineteenth century can boast that this accident has been proved to be amenable to conservative measures, and that taxis has been shown to be capable of effecting a cure and preventing a resort to a mutilating surgical procedure.

So far as we have been able to ascertain, the first cases of chronic inversion which were successfully reduced by taxis are those mentioned by Colombat[1] in the following passage: "Dr. Daillez[2] reports in his dissertation that the surgeon Labarre de Benzeville had effected the reduction as late as the eighth month, and Baudelocque after eight years." In later times the first successful case occurred in 1847.[3] The inversion had lasted more than a year, when M. Valentin, by introducing one hand into the vagina and making counter-pressure by the other over the abdomen, succeeded in reducing the displaced fundus in ten minutes. In 1852, Mr. Canney[3] in the same manner effected reduction in a case of five months' standing, and in the same year M. Barrier[4] accomplished it in one which had existed for fifteen months.

Up to the year 1858 the reposition of inverted uteri may be said to have been limited to replacement within short periods after parturition. It is true that occasional cases had occurred in which chronic inversion had been overcome by taxis and pressure, but these held the position of accidental and anomalous feats in treatment, not that of systematic procedures, which it was incumbent upon the practitioner to essay in every case. At this period two cases of chronic inversion were reduced—one of twelve years' standing by Prof. Tyler Smith of London, by elastic pressure and taxis; the other of almost six months' standing by Prof. James P. White of Buffalo, U. S., by taxis alone. Each of these gentlemen worked without the knowledge of what the other was doing, and to them belongs the great credit of having systematized and made subservient to science and humanity a method which before had been practised in a loose and desultory manner. Soon after their publications cases of cure affected by taxis alone, or combined with pressure by bags of air or water placed in the vagina, were rapidly reported from different parts of the world. Most notable among these were the cases of Noeggerath, of thirteen years' standing; Teale, of two and a half years; West, of one year; White, of fifteen years; and Bockendahl, of six years. When it is stated that all these occurred in 1859, it will be fully appreciated how great an impetus was given to this subject by the successes of Smith and White. Within the past ten years cures have multiplied so rapidly as to preclude the mention of individual cases in a work of the character of this; and, although we cannot go so far as to endorse the sanguine prediction of White, made in 1872, that "well-directed pressure upon the fundus, if continued long enough, will, in all cases where there are no adhesions, result in restoration or reposition," we do believe that the day has passed when any practitioner would be held blameless by a jury of his peers who has either left untouched or amputated a uterus in the condition of chronic inversion without some special reason apart from the mere displacement itself.

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[1] Colombat, Am. ed., p. 186.

[2] Daillez's *Thesis* appeared in 1803.

[3] Quoted from Ranking's *Abstract*, vol. vii., by G. Hewitt.

[4] Courty, *Mal. de l'Utérus*, p. 797.

The best methods at our command for replacing an inverted uterus we shall now proceed to describe, premising this description with the statement that we do not propose to mention all methods which have been adopted, but only those which are most worthy of reliance. They may thus be presented at a glance:

Methods for effecting gradual reduction.	Elastic pressure by vaginal stem and cup or bulb; Elastic pressure by vaginal water-bag combined with taxis; Elastic pressure by vaginal water-bags alone; A stream of cold water.
Methods for effecting rapid reduction.	Manipulation by Viardel's method; " " Emmet's " " " Barrier's " " " Noeggerath's " " " Courty's " " " Thomas's " " " White's " " " Tate's "

None of these methods are free from danger; in several cases even elastic pressure has excited fatal peritonitis. But gradual reposition is certainly much safer than rapid reduction.

Before the practice of any of them certain preparatory measures calculated to relax the cervical parenchyma or render its resistance less decided may be essayed. One of these is the use of belladonna by the vagina in the form of vaginal injections of the infusion, of ointment smeared around the uterine neck, or of hypodermic injection; or by the rectum in the form of suppository. The other is the making of two or three longitudinal incisions through the superficial layers of the parenchyma of the neck. This method is a very old one, dating back to Millot[1] in 1773. Since his time it has been repeatedly advised; for example, by Colombat, Gross, Sims, Barnes, and others. Of the benefit of the first of these methods there is little doubt; of that of the second there is none.

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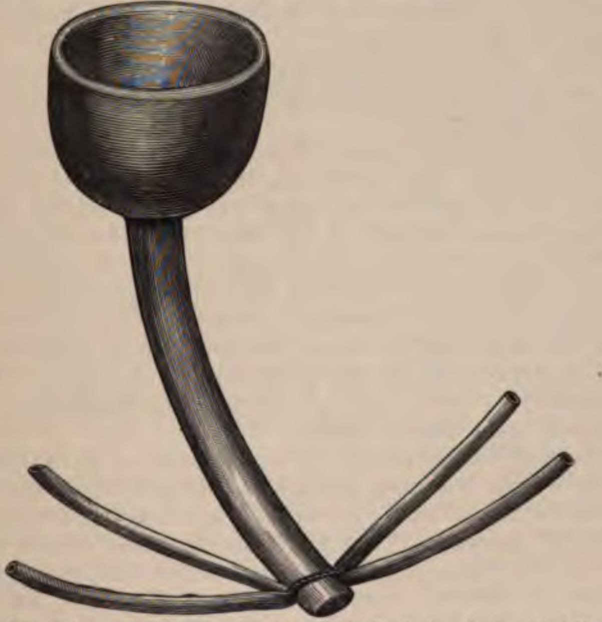
[1] Taylor, *op. cit.*

Gradual Reduction by Repositor.—This method dates back to Von Siebold,[1] who employed a curved stem surmounted by a fine sponge, the stem being held *in sitû* by a T-bandage. After him it was repeatedly and successfully employed, and to-day it is coming again into favor, having been recommended by Drs. Hicks and Barnes of London. The former employs a solid stethoscope, the large extremity covered by India-rubber; the latter, a hollow caoutchouc cup fixed to a curved stem. Both of these are supported by a T-bandage.

FIG. 231.



Cup and Stem for making Continuous Pressure in Replacing the Inverted Uterus.

Before the cup is adjusted a long compress, consisting of a bag of muslin stuffed loosely with cotton, should be placed across the hypogastrium, so as to extend from the anterior superior spinous process of one ilium to the other, and to lie just above the symphysis pubis. This should be fixed in position by a band of adhesive plaster made to encircle the body entirely. The compress, being about eight inches in circumference, forms a firm ridge across the pelvis and furnishes counter-pressure against the retreating uterus. The bands represented as attached to the stem of the instrument may consist of India-rubber tubing or of India-rubber elastic bands, by which gentle, steady, and gradually increasing pressure may be kept up.

This constitutes one of the best, if not the very best, of all the means at our disposal for effecting gradual reduction of the inverted uterus. One point requires special attention: sometimes, when the vagina is abnormally voluminous, the uterus gets out of the line of pressure; it bends upon itself above the edges of the cup, and not only does the pressure exerted accomplish no good; it absolutely does harm, and creates the danger of inflammation of the tissue of the uterus. This should be prevented by tamponing around the cup, after it is adjusted, with carbolized cotton, as explained in connection with elastic pressure by the water-bag.

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[1] Ch. F. Weiss, Paris, *op. cit.*

The force exerted by the elastic bands should not be great, for we should look for the desired result not to great but to gradual and steadily sustained pressure.

Elastic Pressure by Vaginal Water-bag.—The demonstration of the important fact—the most important, indeed, connected with this subject—that elastic pressure was capable of greatly aiding reposition of an inverted uterus belongs to the late Dr. Tyler Smith. We say "greatly aiding," for he combined taxis with it. It was left for Bockendahl of Germany to prove that it could effect reduction unaided. Smith's plan consists in passing the hand into the vagina night and morning, and kneading the uterus for ten minutes, and during all the intervening period keeping an air-pessary in the canal. Bockendahl simply trusts to elastic pressure alone, thus making an important improvement upon Smith's plan.

The best method for employing elastic pressure we have found to be this: Pass a Sims speculum and tampon around the uterus firmly with carbolized cotton soaked in glycerin, so as to keep it from slipping out of the line of pressure. Then introduce an India-rubber bag and fill it with water. Cut a strip of adhesive plaster two and a half inches wide, and of sufficient length to extend from the lumbar region between the thighs of the patient and as high up as the navel. Two holes should be cut in it, one for the tube of the rubber bag to pass through, the other to leave the urethra free. After the bag is introduced into the vagina this strip of plaster is heated and attached to the surface. The bag may afterward be rendered more tense by pumping in water, or the amount of its contents may be diminished by turning the stopcock, which prevents its escape. While the method is in operation the patient should be kept in bed and all pain quieted by the use of opium. The bladder should be emptied by the catheter, and the bowels, previously thoroughly evacuated, be kept constipated.

A Stream of Cold Water.—This method has not been sufficiently tested to command confidence, but it is worthy of mention and consideration. Dr. Charles Martin[1] of France succeeded in effecting reduction in a case which proved rebellious to other means by this, which he tried in the following manner: He introduced the speculum around the inverted uterus twice a day, and threw upon the fundus with force, by means of a syringe, a stream of cold water. Then filling the speculum with cold water, he kept the uterus immersed for three or four minutes.

There is no limit to the time during which efforts at gradual reduction may be persevered in. Such a limit is established solely by the patient's tolerance of the method tried. In one of the cases mentioned elastic pressure was kept up for eighteen days with successful result. Sometimes, however, the patient cannot tolerate elastic pressure or that by a repositor, for symptoms of peritonitis result from their use. Then it is that anæsthesia and rapid reduction offer themselves as valuable resources.

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[1] *Gaz. des Hôp.*, 1853.

Rapid Reduction by the Old Methods of Taxis.—Taxis has been practised for the reduction of chronic inversion certainly since the beginning of this century, and perhaps before that time, in two entirely distinct methods. First, the manipulations of the operator are directed to the constricting cervix, in order to overcome resistance there and to return first the parts which last escaped. Second, these manipulations are directed to the body, in order to return first the parts which escaped first. The first of these methods is thus described by Capuron:[1] "If the orifice be not sufficiently dilated to allow the inverted portion to return easily, it is a better plan to take the tumor in the palm of the hand, with the fingers distributed around its pedicle, and to reduce first the portion which was inverted last, as if we were dealing with a hernia." "We encounter at this point," says Aran,[2] "two opinions which have arisen in relation to the reduction of the uterus inverted during labor; one party desiring to return first the parts which escaped last, subjecting the uterus to a general compression, so as to soften it to a certain extent and force it to pass the orifice little by little, commencing with the least voluminous parts. . . . . Arrived at the tumor, if the operator wishes to employ the first method, he kneads it so as to soften it and cause it to pass more easily through the constricted orifice in which he engages his fingers." Becquerel[3] describes it thus: "It is advisable, as far as practicable, to return first the parts which last escaped; for in this way we dilate in advance the muscular fibres which oppose reduction (P. Dubois Danyau). . . . . M. Velpeau considers this the best method."

The second method of taxis consists not in manipulating the "constricted orifice in which he engages his fingers," so as to "dilate in advance the muscular fibres which oppose reduction," as Aran and Becquerel express it, but in dimpling or indenting the fundus itself, so as to make of the indented or invaginated portion a species of wedge which is forced into the cervical constriction. In recent cases of inversion, occurring, as the vast majority of these cases do, after labor, 350 out of 400 reported by Crosse having done so, the centre of the fundus may be indented and carried up through the cervical canal; and even in chronic cases such an invagination has been attempted. Our impression is that the manipulations practised on the fundus in chronic cases act not in this way, but in overcoming cervical resistance, and thus accomplishing in a more indirect and imperfect way what the French method, styled the method of Viardel by Becquerel, does by engagement of the fingers within, and direct expansion of, the cervical constriction. It is scarcely applicable to other than recent cases.

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[1] *Mal. des Femmes*, 2d ed, p. 510.

[2] *Mal. de l'Utérus*, p. 901.

[3] *Mal. de l'Utérus*, tome 2, p. 314.

The diagnosis having been clearly made and reduction determined upon, the bowels and bladder should be emptied, and the patient put under the influence of an anæsthetic and laid on her back upon a strong table. The operator should always be attended by three or four reliable counsellors, upon whom he may call not only for advice, but physical aid. As the late Prof. Elliot has pointed out, the strength of one man will often fail to accomplish what that of several, replacing each other in rapid succession, will readily effect. Having thoroughly oiled one hand, the nails of which have been pared, the operator should slowly dilate the vagina so as to introduce it and grasp in its palm the entire tumor. The other hand should be laid upon the abdomen, so as to press just over the ring which marks the non-inverted cervix, and oppose the force exerted through the vagina, so as to prevent too great stretching of this canal.

[In a case of four years' standing which I attended with Dr. Joseph Worster of this city, and which had been subjected to eight attempts previous to my seeing it, each varying in duration from two to three hours, I suggested substituting for the hand a cone of boxwood four inches long. The patient being very thin, this could readily be inserted into the abdominal ring of the uterus, and it was gradually forced down into the inverted fundus for such a distance as to dilate the cervix and allow reposition. Since the experience gained in that case I have always employed this abdominal plug for counter-pressure, except in fat women; and this course has likewise been adopted by Byrne and others.—T. G. T.]

In attempting reduction by the hand in the vagina clasping the inverted uterus, the operator should not adhere too long to one plan of manipulation, but try, one after the other, the methods of manipulation which will now be mentioned:

Emmet's Method.—This consists in giving to the finger encircling the cervix a decided motion of extension, while counter-pressure is actively kept up by the fingers over the abdominal ring, so as to expand this by the conjoined action of the two hands. We had supposed this method to be identical with that of Viardel, but its proposer declares it to be different from it in many essential respects, and speaks highly of its merits. A full exposition of it will be found in his work upon *The Principles and Practice of Gynecology*.

Barrier's Method consists in spreading the four fingers around the uterus, pressing the thumb against the fundus, and forcing the neck against the curve of the sacrum as a point of resistance.

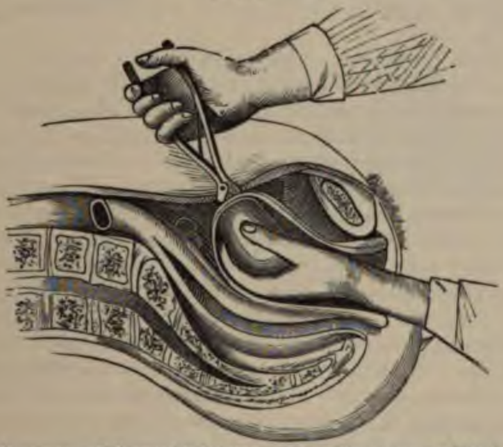
Noeggerath's Method consists in placing the index finger upon one horn of the uterus, the thumb upon the other, and so compressing as to invert one or both cornua. Before reinversion of the neck it should not be tried. For reducing the body after the neck has yielded it is a most valuable plan. [I have succeeded by it in 3 out of 5 cases which I have treated.—T. G. T.].

Courty's Method consists in passing the index and middle finger up the rectum, dipping them into the cervical ring, and thus gaining a point of resistance. It is one of the best at our command, and may be combined with Noeggerath's method—one being directed to reduction of the neck, the other to that of the body.

Thomas's Method consists in abdominal section over the cervical ring, dilatation with a steel instrument made like a glove-stretcher, and reposition of the inverted uterus by any one of the methods mentioned, by the hand in the vagina. Fig. 232 will render this clear.

This procedure, let it be remembered, is not offered as a method of treating inversion of the uterus, but as a substitute for amputation. Few cases will, we think, resist elastic pressure and judicious taxis, but that some will do so cannot be questioned. It is to save these few cases from amputation that abdominal section is suggested.

FIG. 232.



Replacement of Uterus by Dilatation through Abdominal Incision.

One of the cases operated on in this way has proved fatal. Let it not be forgotten that a certain number of those cases treated by elastic pressure and by taxis likewise do so, for, as in my second case, these operations are often performed upon exsanguinated women whose blood is impoverished. One instance of death after reduction by elastic pressure is recorded by Lawson Tait in the eleventh volume of the *London Obstetrical Transactions*, while one of the earliest cases on record reduced by taxis, that of Dr. White of Buffalo, likewise ended fatally.

Tate's (Cincinnati) *Method* consists in introducing the index finger of one hand into the rectum, and that of the other into the bladder, and with both dilating the cervical ring, while the two thumbs in the vagina press the fundus upward. Theoretically, this method is exceedingly plausible, but we doubt whether both bladder and rectum may not be injured by the pressure. Tate reports a reduction by his method after forty years of inversion.

If a case should prove rebellious to taxis repeatedly and intelligently applied, and to prolonged and powerful elastic pressure, what is to be done? Only two courses have been open to us: one to leave the case unrelieved, the other to perform amputation. In an elaborate report of cases of inversion given in the *American Journal of Obstetrics* for

August, 1868, the results in fifty-eight cases of amputation are given. By this statement it will be seen that nearly one-third of all operated upon died; and let it not be forgotten that this number died, not in being cured, not in an effort, even, at attaining perfect health, but in an attempt at purchasing immunity from a series of dangerous and annoying symptoms at the price of that organ of which Hippocrates says, "Propter uterum est mulier."

It is incumbent on us to state that this method has not received the endorsement of the profession. Appreciating this, we should have omitted it entirely from enumeration here did we not feel that in the future it will receive more favorable consideration and prove of real value.

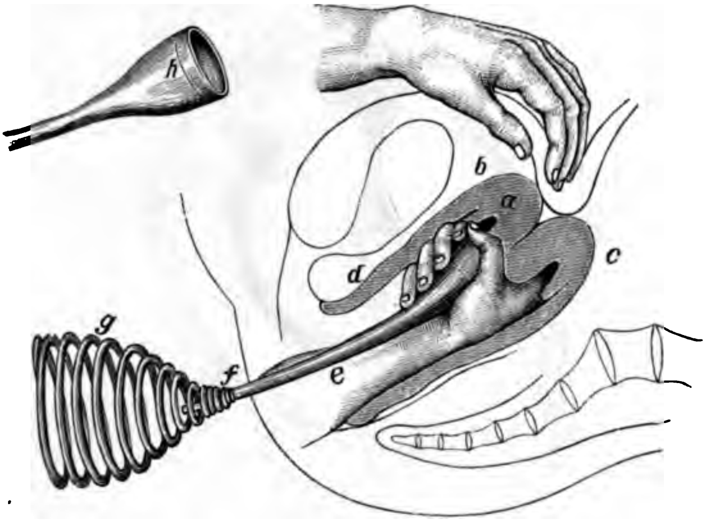
[In one case of puerperal inversion of several months' standing I felt justified in adopting eventually the last resort of amputation, after several prolonged attempts at manual reduction had been made by myself and others before me. The inverted organ had become so bruised and soft that I feared further manipulation would perforate it. Hence, I performed laparotomy, and with two glove-stretchers attempted to dilate the cervical ring and effect reduction. But as soon as the stretchers were withdrawn the ring contracted so firmly that it was absolutely impossible to force the uterus through it. Finally, I passed a Peaslee needle through the abdominal wound and fundus into the vagina, attached a stout silk ligature armed with a thick rubber drainage-tube to it, withdrew the needle, and, using the ligature with the drainage-tube as a fulcrum on the fundus, attempted thus to draw the latter through the ring, which I kept dilated at the same time. But the bent drainage-tube tore through the macerated fundus, and nothing was left for me but to amputate the uterus. I removed the ovaries and tubes, closed the abdominal incision, and applied an elastic ligature about the uterus just below the extensor os. On the thirteenth day the uterus was found to have sloughed away, and the patient made an uninterrupted recovery. I do not recommend this procedure, but report the case merely to show what occasionally must be done from sheer necessity.—P. F. M.]

The use of a repositor by which to make direct pressure and aid in reduction has been resorted to by Depaul and others. Prof. J. P. White has successfully employed one which by its simplicity and efficacy makes it worthy of especial mention. Fig. 233 shows this instrument, and likewise makes evident the method of reduction which the experience of nine cases extending over a period of fifteen years has led him to adopt.

Excellent repositors have likewise been invented by Aveling and Byrne. The latter of these is constructed upon the best mechanical principle which has ever been applied to this process, consisting of a cup which is made shallower and less capacious by the action of a screw at its lower extremity as the inverted uterus gradually returns to its place. We have employed it with perfect success in one case, and esteem it very highly.

It impossible to set an absolute limit to the time which should be alloted to one attempt at immediate reduction, but these efforts cannot be persisted in much longer than one or two hours without great danger of cellulitis or peritonitis. It is true that numbers of successful cases are on record in which from three to five hours have been spent in continuous exertion before success was accomplished, and in which no unfavorable symptoms have arisen; but a safer and more judicious course would be to desist after a reasonable effort, secure what has been gained by placing a caoutchouc bag in the vagina or closing the os uteri

FIG. 233.



Rapid Reduction by White's Method. Operator grasps uterus, *a*, and presses his chest against spiral spring, *g*, *f*, which forces cup of repositor against fundus.

by silver sutures as practised by Emmet, after the method shown in Fig. 234, administer a large dose of opium, and make another attempt in thirty-six or forty-eight hours. Manipulation should then be cautiously repeated for about the same period, and again, in case of failure, followed by the air-bag or closure by suture.

Methods of Amputating.—Although it cannot be denied that instances may present themselves in which, from impossibility of returning the inverted uterus, removal of the whole organ is indicated, it is equally undeniable that the operation has been resorted to very often upon insufficient grounds and before efforts at reduction had been fairly tried. Tyler Smith succeeded after persevering with elastic pressure for eight days, and Dr. F. A. Ramsay[1] of Knoxville, Tennessee, after seventeen or eighteen days of effort. Does any one doubt that in the hands of many less persevering practitioners both these cases would have been treated by amputation before success was attained? Amputation of the inverted uterus will surely be less frequently performed in the future than it has been in the past. It is destined to assume among operative procedures its proper place as a last resort. In addition to its own manifest and inherent dangers it must ever present these great objections:

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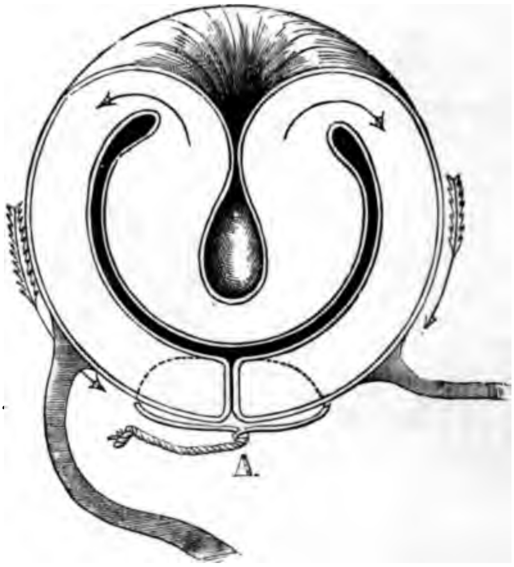
[1] Taylor, *op. cit.*

1st. Hernia of the abdominal or pelvic viscera may have taken place into the inverted sac;

2d. It frequently produces emansio-mensium and its train of evils;

3d. It necessarily results in sterility.

FIG. 234.



Partly-restored Uterus sustained by Closure of Os Externum (Emmet).

It is impossible to conceive of circumstances which would justify the procedure before full consultation with the most able counsel attainable.

Removal of the uterus, although attended by great danger, often ends in recovery. This will not be wondered at when it is borne in mind that even tearing away of the organ has been several times recovered from. Radford, J. C. Clarke,[1] and others have reported cases in which an inverted uterus has sloughed off from strangulation without a fatal issue, and Osiander for many years showed a patient in his lecture-room from whom, after delivery, the midwife tore away not only the placenta, but the inverted uterus to which it was attached. A case of similar kind is recorded in the *Gazette des Hôpitaux* for 1842. One child being born, the midwife felt the breech of another, as she supposed. Around it she passed a handkerchief, pulled with all her force, and dragged away uterus and adnexa. The patient recovered!

A comprehensive view of the results of amputation is presented by Dr. West in the following table:

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[1] *Dublin Journal,* 1837.

		Recovered.	Died.	Operation abandoned.
Uterus removed by ligature	45	33	10	2
" " " knife or écraseur	5	3	2	
" " " knife or écraseur, preceded by the ligature	9	6	3	—
	59	42	15	2

Out of 58 cases of amputation collected in the report in the German journal recently alluded to, 18 were fatal—nearly one-third.

Should it be deemed advisable to resort to this procedure in spite of the dangers incident to it, there are four methods by which it may be performed: the knife or scissors preceded by the ligature; the écraseur, preceded by the ligature; the elastic ligature; and the galvano-cautery.

Experience proves that removal of an inverted uterus by the knife, or even the écraseur, is likely to be followed by profuse and dangerous hemorrhage. To avoid this a method advised by Dr. McClintock of Dublin may be adopted. It consists in the application of a strong ligature for from two to three days before the operation. This obliterates the vessels, and just about the time that decomposition of the strangulated organ begins amputation is practised. Even should the galvano-cautery be resorted to, so great is the danger of immediate and remote hemorrhage that it is advisable to precede its use by that of the ligature for a few days. Courty strongly recommends ligature of the neck of the inverted organ by a rubber ligature, which he tightens on the second day as much as possible. The uterus is amputated by this on the twelfth or fourteenth day. During the use of all these methods pain and nervous disturbance should be quieted by the hypodermic use of morphia, and septicæmia obviated by antiseptic vaginal injections.

Hegar and Kaltenbach[1] recommend the following plan for amputation: Sutures of metal or silk are passed through the cervix high up, and tightly drawn so as to constrict all vessels and completely close the peritoneal cavity. Then, by any means which the operator may select, the body of the uterus is amputated. By this procedure hemorrhage is kept under control, and the parts are so arranged as to favor subsequent union.

Removal of the uterus by ligature alone should never be attempted. Not only have we better and safer means; statistics prove this to be an especially dangerous method. Out of 33 cases thus operated upon, 17, over half, ended fatally. [The elastic ligature seems to me by far the safest method.—P. F. M.]

Résumé of Plans of Treatment.—Let us suppose that a case of chronic inversion applies for treatment to a general practitioner; what are the methods by which he could most easily and safely test the question of his ability to overcome the difficulty without resorting to the aid of a specialist? We would advise the following course as having these advantages: it is often equal to the accomplishment of replacement; even when it does not prove so, it is safe; and it does not ordinarily alienate the co-operation of the patient, as an injudicious course may very readily do by the discomfort which it induces:

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[1] Hegar and Kaltenbach, *Op. Gyn.*, p. 279.

1st. The bowels should be thoroughly evacuated by a course of mild cathartics; vaginal irritation and engorgement be relieved by copious hot vaginal injections; and uterine congestion, which always exists, be overcome by rest.

2d. Pressure by the cup and stem should then be fully tried for a fortnight, hot vaginal injections and inunction of the cervix with belladonna being employed at the same time.

3d. Elastic pressure by vaginal water-bags should then be tried, the uterus being kept in the line of pressure by means of a tampon of antiseptic cotton saturated with glycerin.

4th. Should this not produce good results in a week, and no untoward symptoms have developed, taxis should be tried for a short time once or twice a day.

5th. Should success not now crown his efforts, the practitioner might try the use of a stream of cold water projected against the inverted fundus, or this might be combined with elastic pressure, taxis, and the other means just mentioned.

All these means failing, resort to more radical, efficient, and hazardous ones will now become necessary. But let the practitioner remember that so long as the temperature and pulse remain normal or nearly so, and there is absence of severe pain, he may with safety persist in the mild efforts at reduction which have been mentioned, even for several weeks. Should every general practitioner do this systematically and intelligently, few, very few, cases of this accident would fall into the hands of the specialist, and a great deal of fame now concentrated upon a few would be distributed among many.

The day for rapid and brilliant replacements of the uterus in condition of chronic inversion has passed and gone. There are unquestionably cases which may call for immediate or at least for rapid replacement, and others which will demand the most heroic resources of surgery, from the fact that all milder ones have failed. But the rule should, with our present light upon the subject, be positively and unhesitatingly accepted that gentle, slow, and safe methods should always take precedence over rapid, harsh, and dangerous ones. As a very general rule, time is here a matter of no moment. Certainty of result and freedom from danger are the great desiderata. A case of chronic inversion presenting itself under the circumstances which are ordinarily attendant upon the condition, the surgeon who selects the plan of rapid over that of gradual reduction is exposing his patient to risks which might have been avoided in the attainment of a result which would have been as likely under the safe as under the dangerous course. If all goes well after adoption of the latter, neither surgeon nor patient will question the wisdom of the choice; but supposing that a fatal issue occurs!

It must be appreciated that we do not undervalue the serious procedures which have been recommended and practised for obstinate cases of inversion. We would unhesitatingly resort to them after failure with safer and less efficient procedures. It is a resort to them as a matter of election, and before the milder means have been tried, that we deprecate—a willingness to weigh the safety and interests of the patient against any other consideration that we condemn.

As one looks back upon his experience in surgery he can see many cases which, if he could have availed himself in them of knowledge which did not exist a few years ago, would in all probability have had a favorable instead of a fatal result, and he feels regret. If he have at his disposal resources which could have produced such a happy change in the record, and which he from choice did not use, regret is apt, in the mind of a conscientious man, to merge painfully into remorse.

Hernia of the Uterus—Hysterocele.

In order to complete the subject of displacements of the uterus we will mention a very rare form—namely, that where the uterus is found in the sac of an inguinal or crural hernia. Cases of this kind have been reported by Olshausen, Leopold, Rectorzik, Winckel, and Scanzoni.[1] In the two latter pregnancy up to the fourth month complicated the case.

The uterus may enter the hernial sac either in consequence of traction by the adherent intestine or omentum, or because in large crural herniæ the peritoneum of the corresponding broad ligament forms a part of the hernial sac and draws the uterus after it.

The diagnosis is usually not difficult, because the uterus is found absent from its normal position and the contents of the hernial sac are larger than is generally the case. If the uterus should be gravid, its increasing size will naturally help to make the diagnosis.

Treatment.—Of course as soon as the diagnosis is made, reposition of the contents of the hernial sac is indicated. This should be performed in the usual manner, if possible. If pregnancy is present, abortion *per vias naturales* should be induced, or if irreducible Cæsarean section, perhaps even removal of the whole organ after Porro's method, may be called for. Winckel operated in this manner, and fastened the stump in the abdominal incision. His patient recovered.

CHAPTER XXXII.

PARA-UTERINE CELLULITIS.

History.—The history of this affection presents one of those examples which are often repeated in medical literature, of a subject which was once understood being subsequently completely overlooked and forgotten.

There can be little doubt that it is to this disease that allusion was made by Archigenes, who flourished in the second century, and whose account of it was subsequently repeated by Oribasius in the fourth and Aëtius and Paul of Ægina in the sixth and seventh. The last two unquestionably refer to it under the head of "Abscess of the Womb," for in one passage Paulus especially speaks of cases in which the "aposteme is seated about the mouth of the uterus."

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[1] I saw this case, and myself induced and completed the artificial abortion.—P. F. M. See Scanzoni's *Beiträge*, 1867.

The modern history of the subject may be thus stated:

Described by	Richard Wiseman,[1] England, as "distempers of the uterus in childbed"	1679
"	Nichs. Puzos,[2] France, as "dépôts laiteux"	1743
"	Bourdon, a pupil of Récamier, as "fluctuating tumor of true pelvis"	1841
"	Doherty, Ireland, as "chronic inflammation of the appendages of uterus"	1843
"	Marchal de Calvi, as "intra-pelvic phlegmonous abscess"	1844
"	Churchill,[3] Ireland, as "abscess of uterine appendages"	1844
"	Lever, England	1844

It will thus be seen that after being appreciated, then entirely forgotten, then for a second time brought into notice, the knowledge of this affection languished for nearly two centuries, to be suddenly restored by the efforts of four investigators who entered the field almost simultaneously. It would be unjust to a conscientious observer, M. Auguste Nonat, not to mention the great influence which his writings have had in advancing our knowledge; but when he commenced his investigations in Hôpital Cochin in 1846 the morbid state which he subsequently did so much to elucidate had already received considerable attention in Great Britain.

Definition, Synonyms, and Frequency.—This disease, which is now known to be of frequent occurrence, consists in an inflammation of the adipose and areolar tissue lying behind, in front of, and at the sides of the uterus, and extending up between the layers of serous membrane which make the broad ligaments. It has been described by different writers under the following titles: parametritis, peri-uterine phlegmon, inflammation of the broad ligaments, pelvic abscess, and pelvic cellulitis. The last term, which was applied to it by Sir James Simpson, indicates the nature and seat of the disease, but it is open to the grave objection of being too general in its application, and not sufficiently confining within proper limits a distinct and well-defined affection.

Anatomy.—"The subperitoneal pelvic tissue," says Dr. Savage,[4] in his work on the *Female Pelvic Organs*, "fills up all that part of the pelvic cavity between the pelvic 'roof' and floor of the pelvis which is not occupied by the viscera, and is the sole bond of union between them." Any one can satisfy himself as to the abundance of loose cellular tissue in the pelvis by even a rough dissection. It will be found in the broad ligaments in great abundance, separating their contents, between the vagina and rectum, the rectum and sacrum, the uterus and bladder, the bladder and abdominal parietes, and investing the psoas and iliac muscles. The relations of the urethra and rectum to this tissue are peculiar, each being isolated in a sheath or canal which may be removed with ease.

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[1] McClintock, *Diseases of Women*, p. 1.

[2] Drs. West and McClintock date the appearance of Puzos' *Traité d'Accouchement*, 1759. They are probably in error, as Bernutz and Nonat both date it 1743.

[3] West, *Diseases of Women*, Am. ed., p. 310.

[4] Savage, *op. cit.*

Everywhere around the pelvic organs cellular tissue exists except between the peritoneum and uterus. Here so little is discoverable that some have ventured to deny its existence, while all admit that over the body of that organ it is difficult of demonstration. Dr. Farre[1] declares that along the median line and over the whole fundus he has found the peritoneum inseparable from the uterus, except after prolonged maceration. On the sides of the organ and at the cervix the connection is not so intimate, loose cellular tissue existing at these points to such an extent as to permit of the investing membrane gliding upon the uterus. M. Goupil,[2] who has made a special study of this tissue, declares that it is so small in amount at the point of contact of the peritoneum and vagina and in front and rear of the uterus that "its presence can scarcely be determined."

Pathology.—According to the wide range given to the affection by the majority of English pathologists, this areolar tissue is the seat of the disease under consideration, which may affect any or all of its parts. Drs. West, Simpson, and most British writers, except Dr. Bennet, adopt this view, and regard as instances of the affection any inflammation of the cellular tissue within the pelvis. But this evidently leads to great confusion. It is certainly not conducive to clearness of comprehension to blend the description of iliac, psoas, and peri-rectal abscesses with this disease.

French writers,[3] on the contrary, regard as instances of peri-uterine cellulitis only inflammation of the cellular tissue of the broad ligaments and of that immediately in contact with the uterus at its junction with the vagina and bladder. While admitting that inflammation originating here may spread, by continuity of structure, to other areolar tracts in the pelvis, they regard these as complications, designating them by different appellations, and do not admit them as elements of this affection. This is the definition which we would adopt, and to express it clearly have employed the term peri-uterine, in place of pelvic, cellulitis.

Para-uterine cellulitis has three stages: 1st, the stage of active congestion; 2d, that of effusion of liquor sanguinis; 3d, that of suppuration. In its course it may be likened to an ordinary furuncle: at first there is simple congestion accompanied by pain, heat, and swelling; then liquor sanguinis is effused, which creates hardness and tension, and lastly suppuration occurs and ends the morbid process, unless one of two other terminations takes place. Resolution may occur, or, in place of suppuration, the areolar tissue involved may be destroyed, as it so generally is in anthrax and phlegmonous erysipelas, and come forth as a sloughing mass.

The term "phlegmon," now almost obsolete with us, but still in use on the continent of Europe, signifying inflammation of areolar tissue, is strictly applicable to this affection. Its source is similar to that of areolar inflammations in other parts of the body, and its three stages are identical with theirs.

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[1] *Cyc. Anat. and Phys.*, Sup., p. 631.

[2] Becquerel, p. 441, vol. i.

[3] Aran, *Mal. de l'Utérus*, p. 675.

The most common seat of para-uterine cellulitis is the areolar tissue of the broad ligaments, and generally that of one side only is affected.

In a certain number of cases, where no affection of the areolar tissue of the broad ligaments exists, circumscribed tumors in immediate contact with the womb have long been noticed. Lisfranc supposed them to be due to partial parenchymatous metritis, "engorgements," which had resulted in enlargements of one part of the organ; and no one contradicted him until Nonat[1] about the year 1849 described them as being due to phlegmonous inflammation in the areolar tissue immediately around the uterus—*i. e.* between the cervix and rectum, the cervix and bladder, and immediately by the side of the neck. The existence of this variety of cellulitis has been denied by Bernutz, who sustains his position by abundant argument. In reference to it we will merely say here that there are, so far as our knowledge extends, only two cases of such limited cellulitis substantiated by autopsic evidence—one reported by Demarquay,[2] the other by Simon.[3] Nevertheless, judging from clinical observation, one is inclined to side with the view of Nonat rather than with that of Bernutz. There are many cases in which abscesses in the broad ligaments point and discharge anteriorly or posteriorly to the cervix, but these come within a different category. The broad ligaments and their entire contents, cellular tissue, ovaries, and Fallopian tubes, are more frequently affected than any other parts, and Aran goes so far as to say that the collections of pus occurring in para-uterine cellulitis "belong more particularly to the ovaries and tubes." In post-mortem examinations these parts are often found imbedded in a mass of effused material, the ovaries, one or both, in a state of suppuration, and the tubes inflamed and filled with pus, or constricted at both uterine and ovarian extremities and dilated with sero-purulent material so as to constitute tubal dropsy. We have examined the post-mortem reports of cases by a number of authorities with reference to this point, and, rejecting only those in which the examination was made in too careless a manner to allow of their admission, we present them in the following table:

No. of Case.	Authority.	Seat of Purulent Collection.
1.	M. Nonat.	Behind the uterus connecting with suppurating cyst in left ovary; small abscess in right ovary.
2.	M. Nonat.	Behind uterus and rectum extending into broad ligaments of both sides.
3.	M. Nonat.	On left side extending from uterus to ilium.
4.	M. Nonat.	Behind uterus and vagina, extending into left broad ligament; another the size of a hen's egg just behind the uterus, opening into a third, very large, extending to sigmoid flexure and into broad ligament.
5.	Dr. West.	Left broad ligament.
6.	Dr. West.	Opposite right sacro-iliac synchondrosis under psoas muscle; another to the left of and behind the rectum.
7.	Dr. West.	Left broad ligament.
8.	Dr. McClintock.	Left broad ligament.

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[1] *Op. cit.*, p. 237.

[2] *Gazette des Hôpitaux*, April 17, 1858.

[3] *Bull. de la Soc. Anat. de Paris.*

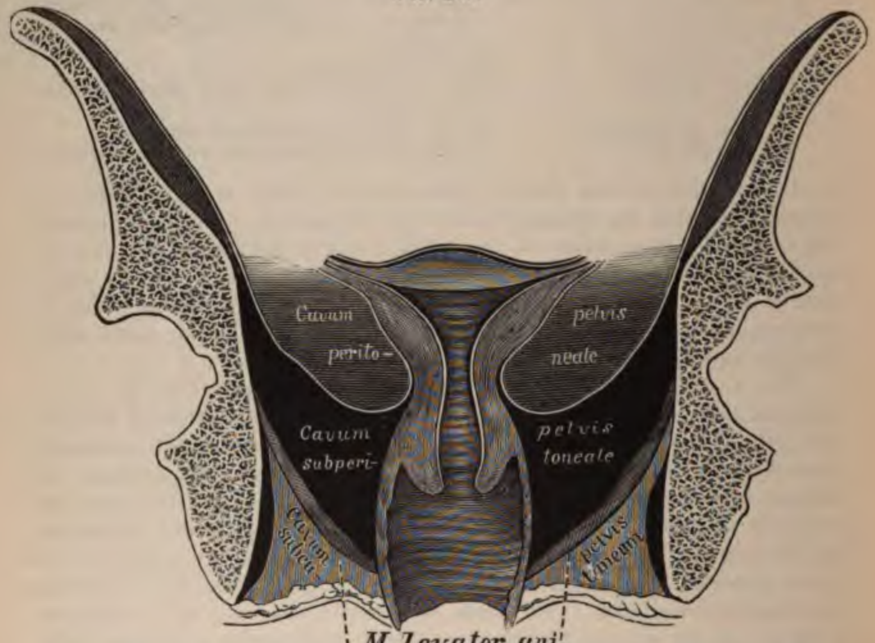
No. of Case.	Authority.	Seat of Purulent Collection.
9.	Dr. Demarquay.	In cellular tissue between uterus and rectum, and also in recto-uterine pouch of peritoneum.
10.	M. Simon.	Size of a small orange, between the bladder and uterus, sending conoidal prolongation into left broad ligament. Its limits were as follows: base of bladder in front; neck and body of uterus behind; peritoneum above; vagina below; at the sides it ran off into the broad ligaments.
11.	M. Aran.	Left broad ligament.
12.	M. Aran.	Left ovary, right tube, with pelvic adhesions throughout.
13.	M. Bourdon.	Size of an apple in left broad ligament.
14.	M. Aran.	At side of uterus and in the left broad ligament.

It will thus be seen that of this number, which is large when it is remembered that the disease rarely ends in death, but two cases present instances of inflammation of the cellular tissue uncomplicated by disease of the ovaries or tubes or of the broad ligaments. One of these, that of Simon, is conclusive of the possibility of such disease; that of Demarquay is doubtful, for with the abscess in the cellular tissue there was also one in the cul-de-sac of Douglas.

The autopsies in the above collection show that there is a very common and complicating connection between inflammation of the pelvic cellular tissue and inflammatory disease with or without accumulation of pus in the ovaries, Fallopian tubes, and pelvic peritoneum. In former days the exact relation between these several conditions was not properly understood, and it was supposed that the purulent collections in the ovaries, Fallopian tubes, and peritoneum were the results of the same process in the cellular tissue of the pelvic cavity. Ovarian abscess, pyo-salpinx, and intra-peritoneal abscess were therefore assumed to be simple complications or consequences of pelvic cellulitis. This is, however, by no means the case, as shown by the investigations of recent days, chiefly as a result of our more correct insight into these affections following the frequency of abdominal section.

It has become fashionable of late for many of our most enthusiastic and progressive laparotomists to deny utterly the existence of such a pathological condition as pelvic cellulitis, except in a few rare instances after parturition, and to assume that all cases of inflammatory exudations in the pelvis, with or without suppuration, are unquestionably intra-peritoneal; that is to say, that *all* cases of pelvic inflammation proceed primarily from the Fallopian tubes, and involve secondarily the ovary and the adjacent peritoneum. Pelvic abscess, as such, exists in the minds of these gentlemen only as a synonym for abscess in the Fallopian tube (pyo-salpinx), ovary, or pelvic peritoneum, any one of which may, by adhesion and perforation, force its way into the pelvic cellular tissue, and thus simulate an abscess resulting from pelvic cellulitis. We would thus find the tables turned upon the old assumption that inflammatory disease of the intra-peritoneal organs adjoining the uterus is the result of inflammatory action in the pelvic cellular tissue. Manifestly, neither view can be correct. In our opinion, inflammation of the pelvic cellular tissue, with its resultant consequences of dislocation of the uterus, pelvic abscess, and cicatricial induration, occurs independently by itself, as well as inflammation of the Fallopian tube, ovary, or adjacent peritoneum, with resultant purulent accumulations in these organs. It is true, a purulent deposit outside of the peritoneum may perforate into that cavity, and the reverse—probably more frequently the latter—and both may exist together at the same time in one and the same individual, or a pyo-salpinx may rupture between the layers of the broad ligament. But that is no reason why they do not frequently occur separately and independently. Pelvic peritonitis and pelvic cellulitis are, in fact, independent and entirely unassociated diseases, just as pleurisy of one part of the lung may occur at the same time with an inflammation of the substance of the lung at another point.

FIG. 235.



Cross-section of the Pelvis, showing the Peritoneal and Subperitoneal Cavities (Luschka).

In our opinion it is decidedly wrong and uncalled for to practically deny the occurrence of pelvic cellulitis. There is no reason why the cellular tissue of the pelvis should be free from the tendency to inflammatory exudation undeniably accorded to the same tissue in every other portion of the body. In the table above cited it seems to us, from our present enlightened standpoint, that the cases in which the uterine appendages were found diseased were probably instances of primary disease of those organs, and only those in which the peritoneal cavity was found intact can be counted as true cases of cellulitis.

Complications.—The complications of para-uterine cellulitis are—

Endometritis;

Metrorrhagia;
Cystitis;
Uterine displacement.

And as coincidences depending upon the same primary causes—

Oöphoritis;
Salpingitis;
Pelvic peritonitis.

The occurrence of these complications with cellulitis is so frequent that they may almost be regarded as elements of it when it exists in severity.

Endometritis, metrorrhagia, and cystitis are natural results produced by the general pelvic hyperæmia which would of course be present under the circumstances. We have frequently seen cases in which the muco-purulent and bloody discharge from the vagina and painful micturition formed the salient symptoms complained of by the patient. Only the vaginal examination revealed the origin of these symptoms and the true nature of the case. As concomitants depending more or less upon the causes which produced the inflammation of the pelvic cellular tissue, we have the sympathetic inflammations of the ovaries, tubes, and pelvic peritoneum. The displacement of the uterus is of course produced by the pressure of the cellular exudation in the pelvic tissue.

Course, Duration, and Termination.—It is necessary that we should here inform the reader that the account which we shall give of this part of our subject will differ essentially from that generally found in systematic works, for the reason that, regarding pelvic cellulitis and pelvic peritonitis, which are usually treated of synonymously, as different affections, we shall attempt to describe them separately. Cellulitis proper—that is, uncomplicated by other diseases—rarely passes into a chronic state, but usually in the course of two or three weeks passes off by resolution or ends in suppuration, the former being much the more frequent termination. Any one of its usual complications, however—peritonitis, endometritis, ovaritis, or salpingitis—may become chronic, and thus leave the impression upon the mind of the observer that the original affection has done so. Or one or more abscesses may discharge themselves by long sinuses which fail to allow of their complete evacuation, and may continue to pour out pus for months or even years. In saying that cellulitis rarely becomes chronic, we look upon chronic pelvic abscess rather as one of its results than one of its stages. If the case be of acute character and occur as a sequel of parturition, suppuration may take place in a few days, but ordinarily, even under these circumstances, it does not occur for two or three weeks. In a chronic case the effused matter may remain hard, resisting, and ligneous for months without showing signs of softening, but such instances are exceptions to the rule. After suppuration has occurred the disease may follow one of three courses:

1st. The accumulated pus may discharge itself, and the abscess gradually dry up and disappear.

2d. The empty sac, lined by pyogenic membrane, may for an unlimited time go on pouring out pus.

3d. Small abscesses may form and discharge in one part, then others may do so in another, until the whole pelvic areolar tissue is perforated by them and by fistulous tracts connecting them.

There are various outlets for the imprisoned purulent accumulation:

1st. Through the abdominal walls or saphenous openings;
2d. Through the pelvic viscera, bladder, rectum, vagina, urethra, or uterus.
3d. Through the floor of the pelvis near the anus;
4th. Through the pelvic foramina, obturator, or sacro-ischiatic;
5th. Through the pelvic roof into the peritoneal cavity.

Sometimes the purulent collection burrows into the surrounding tissues and evacuates itself at a distance. [In one case which I saw with Dr. Echeverria it passed through the sciatic foramen, and, burrowing upward and forward, came forth near the great trochanter.—T. G. T.] It may thus take so eccentric a course as to mislead the practitioner as to the seat of the abscess.

The most frequent channels of evacuation are the vagina and rectum in the non-puerperal form, and probably the abdominal walls in the puerperal, or at least the results of Dr. McClintock's[1] carefully-noted cases would lead us to believe so. In 37 puerperal cases treated by him which ended in suppuration, 20 abscesses discharged in the iliac regions, 2 above the pubes, 1 in the inguinal region, and 1 beside the anus. Of the remaining 13, 6 were discharged *per vaginam*, 5 *per anum*, and 2 burst into the bladder. In the non-puerperal variety it is extremely rare for the abscess to discharge externally, and fortunately in both forms it is rare for it to burst into the perineum.

Prognosis.—A guarded prognosis should always be made as to the time of recovery, for no amount of experience can foresee the course of the affection—whether the effused liquor sanguinis will disappear by absorption in three weeks, whether the discharge of one abscess will end the patient's suffering, or whether a chronic induration will exist for a great length of time. But, fortunately, it may be stated that the prospects as to life are decidedly favorable, though in cases occurring just after parturition there is always some danger from general peritonitis.

Causes.—The disease usually occurs as a result of one of the following causes:

Parturition or abortion;
Inflammation of uterus or ovaries;
Direct injury from coition, caustics, pessaries, operations, or blows.

Parturition or abortion produces, according to statistics, from one-half to two-thirds of all the cases. Even this large proportion we believe to fall short of the truth, from the fact that those collecting the statistics from which the deductions were drawn made no distinction between this disease and pelvic peritonitis. Cellulitis will very rarely be met with, except after the parturient process. It is true that when the puerperal state exists as a predisposing cause exposure to cold, fatigue, over-exertion, etc. will excite it; but under these circumstances they are merely immediate and exciting influences.

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[1] *Op. cit.*

If the uterus, ovaries, or any part of the pelvic organs are in a condition of acute or subacute inflammation, or if an increased vascular engorgement of the pelvis exists, as is the case in impending or present menstruation, naturally the influence of a sudden exciting cause may produce a fresh inflammation of any one of the organs involved more readily than if the parts were in a quiescent state. Hence temporary hyperæmia of the uterus, ovaries, tubes, pelvic cellular tissue, or peritoneum offers an unusually favorable time for the excitation of a fresh inflammation of these organs, but it cannot be said that acute inflammation of the uterus, ovaries, or tubes in itself offers any special inducement for the production of an acute cellulitis. Again, pelvic cellulitis may exist, as already stated, entirely independently of inflammatory disease of the uterus or its appendages. Any chronic or acute disease of either the uterine parenchyma or mucous lining may, however, result in it, and we have more than once seen it follow applications of mild character to the cavity of the uterus.

Direct injury is by no means a rare cause in non-puerperal cases, though it generally proves active in those suffering from previous uterine or ovarian disorders. Thus it may follow operations upon the neck or body of the uterus—slitting the neck for flexion or contraction, for example—or simple dilatation by a tent. It may result from efforts at removal of intra-uterine growths, and one fatal case that we have met followed the ligation of hemorrhoids.

As a rule, irritations inflicted upon the uterus below the internal os will result in pelvic cellulitis; above that point, in pelvic peritonitis. The statement of the late Matthews Duncan that cellulitis is usually not idiopathic, but symptomatic of uterine or ovarian inflammation, is not borne out by recent observation, except on the general principle that all pelvic congestion predisposes to inflammation of one or the other of the organs situated in that cavity.

Symptoms.—The acute form, and more especially that occurring after parturition, is usually ushered in by very decided symptoms, of which the most constant are the following:

Chill;
Increased thermometric range;
Pain;
Fever;
Dysuria;
Metrorrhagia.

The chill, though sometimes absent, is a very general symptom. No sooner does it pass off than the pulse rises to 110 or 120, increased heat is felt in the hypogastric region, and pain, which for a number of hours or perhaps days before was just perceptible, comes on with considerable violence. The thermometer shows marked increase of animal heat, the mercury rising to 103° or 104°, and in severe cases even higher. With these general symptoms there will be others pointing to the rectum and bladder, and should the affection exist in a menstruating woman the flow may be much increased. Even when the patient is not menstruating, uterine hemorrhage sometimes, though not frequently, comes on.

But he who awaits these symptoms for diagnosis will be led into many errors of omission, for subacute cases very generally, and acute cases sometimes, fully develop themselves without them.

All cases may be brought under three heads as to severity of symptoms:

1st. Cases accompanied by chill, fever, pain, and ordinary signs of inflammation;

2d. Those accompanied by pain without chill or fever;

3d. Those marked by scarcely any symptoms except extreme feebleness and some sense of pulsation and weight about the pelvis, with hectic fever toward evening.

Cases which have assumed the chronic form will present themselves with such a history as this; A patient who was delivered one, two, or three months ago has not recovered her strength, but is very feeble, has no appetite, and feels nervous, depressed, and feverish toward evening. She has no absolute pain, but fears that something is wrong about the womb, for now and then she feels a sensation of throbbing, tension, and weight about that organ, which is increased by defecation, urination, and walking. This prompts to physical exploration, which establishes the diagnosis.

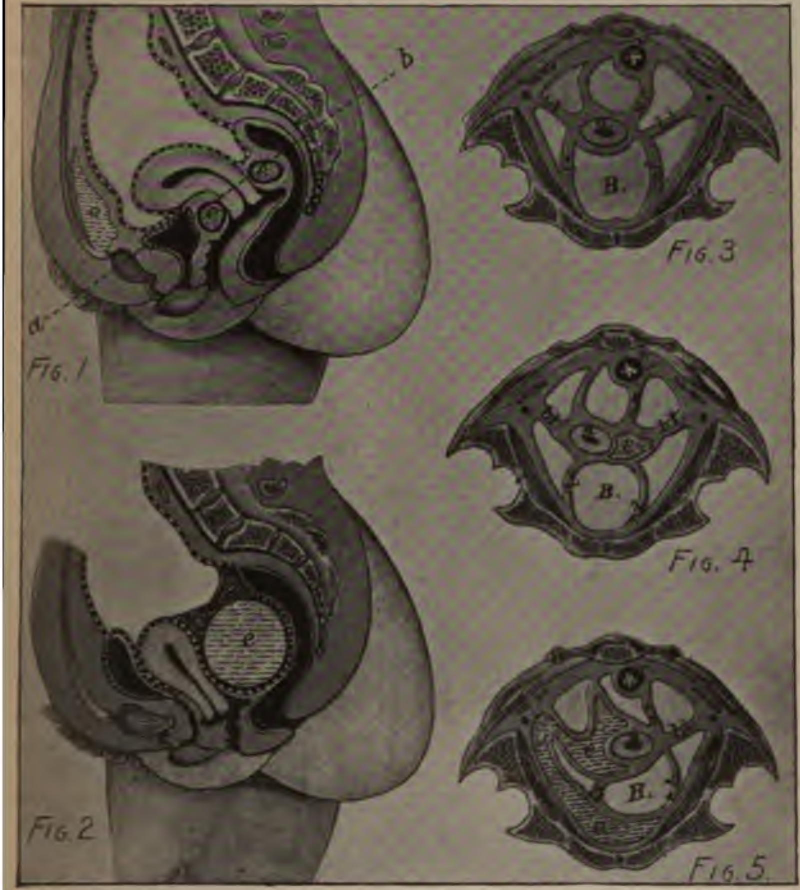
Physical Signs.—Physical exploration is the means on which we must rely for a rapid and certain determination of the character of these cases. Should the finger be introduced into the vagina during the first stage, the parts will be found to be very warm, and perhaps a swollen and œdematous spot may be detected. Upon pressing in different directions great sensitiveness will be observed, and by conjoined manipulation a particularly sensitive point will be detected, usually on one side of the uterus.

As the second stage, or stage of effusion, advances, induration occurs in the areolar tissue affected, and then, by careful vaginal touch combined with external manipulation, a tumor as large as a walnut, a goose's egg, or an orange may be detected in one of the broad ligaments or in the tissue around the cervix.

But the examiner must not suppose that the mere introduction of the finger into the vagina will accomplish a discovery which often requires the greatest care and most thoughtful attention in examination. The finger being passed up to the cervix, and the other hand placed upon the hypogastrium so as to make counter-pressure, it should be carefully pressed against Douglas's cul-de-sac and all around the cervix over the base of the bladder and as far as possible toward the fundus. Then it should be made in a similarly careful manner to traverse the sides of the pelvis where the broad ligaments are placed, and, last of all, those parts below the pelvic roof. For one sufficiently practised in this kind of examination this procedure will generally be sufficient to determine the existence of even a very small point of induration on the sides or in front of the uterus. Sometimes, where it is posterior to that organ, a rectal exploration will throw much additional light upon the case.

Should the disease have advanced to its third stage, in addition to the signs already noted, the uterus, which, as already mentioned, is gen-

PLATE I.



LATE SHOWING THE TOPOGRAPHICAL RELATIONS OF THE PELVIC PERITONEUM AND CELLULAR TISSUE, AND OF THEIR RESPECTIVE EXUDATIONS.

IG. 1. PELVIC CELLULITIS.—Vertical section of pelvic organs, showing (*e*) exudation in the cellular tissue before and behind the uterus and in the anterior abdominal wall (pelvic cellulitis); *a-b* shows plane of transverse section of Figs. 3, 4, and 5.

IG. 2. PELVIC PERITONITIS.—Vertical section, showing (*e*) exudation in Douglas's pouch, separated from healthy peritoneal cavity by adhesions (pelvic peritonitis).

IG. 3. TRANSVERSE SECTION THROUGH NORMAL PELVIS.—*u*, uterus; *r*, rectum; *b*, bladder; *u r*, utero-rectal ligaments; *r l*, round ligaments; *b l*, broad ligaments. Light spaces show sections of peritoneal pouches.

IG. 4. PELVIC CELLULITIS.—The same, with a small exudation (*e*) to left of broad ligament.

IG. 5. PELVIC CELLULITIS.—The same, with large exudation (*e*) in right broad ligament, extending into the cellular tissue of the anterior abdominal wall and distorting the pelvic peritoneal pouches.

(Reduced from Fritsch's *Clinical Plates.*)

erally displaced, is now pushed from its normal position in a direction opposite to the accumulated pus. Sometimes it lies upon the floor of the pelvis, at others it is in a state of anteversion, retroversion, or latero-version, and, more rarely, sharply flexed, the body having remained movable after the cervix has become fixed. Into whatever malposition it has been forced, it remains to a certain extent immovable from fixation by adhesive lymph.

Some authors claim that the fixation is by no means so complete or so universal as in pelvic peritonitis. We are of different opinion, having usually found the uterus absolutely immovable when encased in pelvic cellular exudations. Nonat declares that he has found the phlegmonous mass itself movable, but we are absolutely sure that he has mistaken an intra-peritoneal exudation, or rather a matting together of the inflamed ovary and tube, for a pelvic cellulitis. We personally have never seen an instance in which the exudation in pelvic cellulitis was not immovably fixed.

Differentiation.—We may as well begin this section by the general statement that wherever there is cellular tissue in the pelvis there a pelvic cellulitis and a resultant exudation may be found. This remark applies to inflammations and exudations extending from the perineum to the iliac fossa and perirenal region behind and on either side, and to the umbilical region on the anterior abdominal wall. We have seen retro-peritoneal, and therefore cellular, exudations reach to these several points in a number of instances. Where the limit of the cellular tissue is reached and the region of the peritoneum begins, pelvic cellulitis is no longer found and pelvic peritonitis begins its sway.

The diseases with which it may confounded are—

Pelvic peritonitis;
Hematocele;
Fibrous tumors;
Retro-peritoneal carcinoma.

Fibrous tumors are painless, free from tenderness, and movable in the pelvis. They are unaccompanied by chill, fever, and other signs of inflammation, and are closely attached to the uterus, so as to form part of it. The tumors resulting from cellulitis are the contrary of all this, and appear firmly attached, like bony growths, to the walls of the pelvis.

Hematocele occurs suddenly with uterine hemorrhage, and is marked by prostration, coldness, and other symptoms of loss of blood. The tumor created is soft in the beginning and grows hard; that of cellulitis is hard in the beginning and tends to softening.

Pelvic peritonitis shows the ordinary signs of peritoneal inflammation, great tendency to relapse at menstrual periods, excessive pain and tenderness, and produces no distinct tumor in the beginning, but hardening of the whole pelvic roof. Later, a small tumor may be discovered, but it is usually posterior to the uterus and not on one side of it. The uterus is rather more movable than in cellulitis, especially from above downward, and when the body is fixed the cervix sometimes moves under pressure.

Consequences of Cellulitis.—Neither the immediate nor the remote results of this affection are so grave as those following pelvic peritonitis. The ovaries are seldom involved directly, and the same applies to the Fallopian tubes. It is only when peritonitis supervenes that these organs suffer. The uterus is seldom displaced sufficiently to produce permanent inconvenience; in fact, except when diffuse suppuration with resultant constitutional disturbance and local cicatricial contractions ensue, pelvic cellulitis generally terminates in a complete restoration to health. Therefore, sterility, amenorrhœa, dysmenorrhœa, menorrhagia, tubal dropsy, and displacement seldom remain to attest the apparent gravity of the original disease. In this respect pelvic cellulitis differs most agreeably from its twin sister, pelvic peritonitis.

Treatment.—Should the practitioner be called in the acute stage of cellulitis, the patient should be at once completely quieted by opium. If pain be violent, the hypodermic method should be employed in its administration; if not, it should be given by mouth or rectum. This drug throughout the acute stage of the affection should be steadily kept up. It accomplishes these results: it relieves pain, diminishes the severity of the inflammatory process, keeps the bowels constipated, produces sleep, and creates general nervous quietude. If when first seen the patient be suffering very severely, ten drops of Magendie's solution of morphia may be given hypodermically.

Absolute rest should be enjoined, the patient not being allowed to sit up in bed for a moment upon any pretext whatever. Were we limited to one remedial resource in this affection, we should choose rest in preference to all others, but to accomplish anything it must be absolutely enforced.

The diet of the patient should be mild and unstimulating, consisting of milk with farinaceous substances and tea or coffee.

If the case be seen very early, before the stage of effusion has occurred, a bladder of crushed ice should be laid over the hypogastrium in the hope of arresting the advance of the disease. But if the disease has advanced beyond the point where this seems possible, warm poultices of powdered linseed should be applied every third or fourth hour over the hypogastrium, the bowels be kept regular by mild laxatives and enemas, and febrile action, should it exist, be quieted by refrigerants and antipyretics, such as antipyrine, antifebrin, or phenacetin.

As soon as the acute symptoms have passed, and vaginal touch informs us that the effused material is becoming thoroughly organized, a further effort should be made to break up the morbid train before it passes on to suppuration or into chronic induration, by the application of a blister, six by eight inches, over the hypogastrium. This should not be applied before febrile action and the most acute symptoms have disappeared. Some excellent authorities object to blistering, for fear of strangury resulting. We have never had to do otherwise than congratulate ourselves on its employment. Should the case tend to an acute course and suppuration be impending, this should be encouraged by constant poulticing.

As soon as the acuteness of the attack has passed, until which time attention should be turned to quieting the general symptoms of inflammation, some of the best authorities have advised that the iodide or bromide of potassium should be administered, the former in five-grain doses repeated every third or fourth hour, or the latter in doses of ten, fifteen, or even twenty grains, at the same intervals. At the same time that we are not prepared to deny the utility of these drugs, we confess that we have never been able to persuade ourselves that they really accomplish any good result. We therefore never employ them, but when the temperature has become normal and pain has subsided we have found the administration of iron in some easily digestible form (Blaud's pills, or tincture of the chloride, or Pizzola's iron peptones), with the addition of a mild laxative if necessary, to greatly hasten the absorption of the exudation. The use of mercurials, either in the form of small doses of calomel or bichloride or of inunction, has been carefully tried by us, without, in our opinion, warranting the danger of the involuntary production of salivation.

It may be necessary to repeat the application of the blister before the case ends in suppuration or passes into the chronic stage.

While the patient remains in bed, warm poultices or towels wrung out of warm water and covered by oil silk should be worn over the hypogastrium. An additional emollient remedy of great value is the persevering use of the warm douche for fifteen or twenty minutes, night and morning, after Emmet's method, already described. The fluid used should be as warm as the patient can bear it, and may be slightly medicated in the later stages by the addition of chloride of sodium, tincture of iodine, or iodide of potassium. The injections stimulate the absorbents, and at the same time quiet inflammatory action, in the performance of which functions they are invaluable in these cases.

As the third stage of the disease, or the stage of suppuration, merges into pelvic abscess, it will be best to postpone the consideration of its management to the chapter in which that subject is treated. We will merely state here that after an abscess has formed and evacuated itself, great care should be taken not to allow the patient to exert herself for several weeks for fear of a relapse, and even after she has left the house and begun to exercise regularly, during two or three menstrual periods she should confine herself to bed.

CHAPTER XXXIII.

PELVIC PERITONITIS.

Definition.—Inflammation involving the peritoneum covering the female pelvic viscera, and limited to it, receives the name of pelvic peritonitis. It must not be supposed that by this definition is meant simply that form of peritoneal inflammation arising in the pelvis and spreading into general peritonitis, which has long been described as metro-peritonitis. The disease that we are now considering is one usually strictly limited to the pelvis, presenting symptoms peculiar to itself, and rarely passing into the general form of the same disorder.

History.—Long before pelvic cellulitis was known, peritonitis, limited to the serous covering of the pelvic organs, had attracted attention, and its clinical resemblance to cellulitis, as subsequently described, fully noted. Thus Morgagni[1] relates a case in which, thirty days after delivery, the right ovary and tube were adherent to the colon and almost destroyed by an abscess. Nauche, in his work on *Diseases of the Uterus*, published at Paris in 1816, described inflammation of the uterus as affecting, first, the mucous membrane; second, the parenchyma; and, third, the serous covering. In 1828, Mad. Boivin credited the adhesions resulting from this affection and binding the uterus down with a large number of abortions attributed to other causes, and in 1833 she described immobility of the uterus, for which she gave as causes peritonitis, metro-peritonitis, and pelvic abscess. In 1839, Grisolle[2] distinctly stated that "there are cases of circumscribed peritonitis which, producing a tumor appreciable to sight and to touch, may lead to the belief in the existence of phlegmon"—*i. e.* a tumor the result of inflammation of areolar tissue. Lisfranc,[3] writing ten years after Boivin and Dugès, copies their description very closely in his article on "Fixité de la Matrice" without referring to them, and like them attributes it to peritonitis or metro-peritonitis.

Although these facts were known and universally admitted, they attracted little notice, and after the description of pelvic cellulitis by Doherty and Marchal de Calvi pelvic peritonitis was almost entirely lost sight of. This was due to the fact that the enthusiasm created by the description of a long-forgotten affection caused observers to look upon the results of peritonitis as those of cellulitis, and to describe them as such. Thus the matter rested until 1857, when Bernutz, in a treatise written in concert with M. Goupil, not only drew especial notice to it, but took the position that inflammation of the cellular tissue immediately around the uterus, described by Nonat as "phlegmon périutérin," or what would strictly be termed, in our nomenclature, "peri-uterine cellulitis," did not exist as a pathological reality, but that the lesions ascribed to it were absolutely due to pelvic peritonitis.

These views, published at first in the *Archiv. gén. de Méd.*,[4] are fully elaborated in the admirable work[5] of these observers more recently brought forth. They do not touch the general subject of peri-uterine cellulitis as it exists in the broad ligaments, subperitoneal tissue, and around the rectum, but only that variety supposed to have its seat in the areolar tissue between the uterus and peritoneum.

It has been already stated that Bernutz was incited to his investigations by certain views advanced by Nonat as to the pathology of para-uterine induration, which sometimes goes on to suppuration. But his researches served not only to settle this comparatively unimportant point; they proved the fact, for which the investigator appears to have been himself entirely unprepared in the beginning, that many of those cases regarded as instances of non-puerperal cellulitis are in reality not phlegmonous but peritoneal inflammations. Since the publication of these views we have directed our attention particularly to this point, and from careful observation, both clinical and post-mortem, feel warranted in recording the conclusions at which we have arrived in the following propositions:

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[1] Artic. 22, epist. 46; Nonat, *op. cit.*, p. 234.

[2] Bernutz and Goupil, *op. cit.*, p. 398.

[3] *Clin. Med.*, vol. iii. p. 514.

[4] *Archiv. gén.*, 1857.

[5] *Clin. Méd. des Femmes*, 1862.

1st. Para-uterine cellulitis is rare in the non-parous woman, while pelvic peritonitis is exceedingly common.

2d. A very large proportion of the cases now regarded as instances of cellulitis are really those of pelvic peritonitis.

3d. The two affections are entirely distinct from each other, and should not be confounded simply because they often complicate each other. They may be compared to serous and parenchymatous inflammation of the lungs,—pleurisy and pneumonia. Like them, they are separate and distinct; like them, affect different kinds of structure; and like them, generally complicate each other.

4th. They may usually be differentiated from each other, and *a neglect of the effort* at such thorough diagnosis is as reprehensible as a similar want of care in determining between pericarditis and endocarditis.

Bernutz cites the results of five autopsies[1] by himself, and between twenty and thirty by others, which presented all the signs of pelvic peritonitis and none of cellulitis, although during life the symptoms and signs generally attributed to the latter disease were present. As an example conveying some idea of the close clinical resemblance between his cases found in autopsy to be peritonitis and those ordinarily regarded as cellulitis, we quote the salient points in his sixth observation:

Patient 33, lymphatic temperament, entered hospital November 24th for feebleness, pain in the back, emaciation, and dysmenorrhœa. After a while loss of appetite, increase of pain, and chills appeared. By touch the uterus was found completely fixed low down in the pelvis and inclined to the right side, and attached to it a very sensitive tumor the size of a hen's egg, extending behind the womb. On the 15th of December this tumor was as large as a turkey's egg. February 1st, tumor only the size of a pigeon's egg; a circumscribed tumor on the left attached to uterus and to walls of the pelvis. March 23d, uterus movable and tumor reduced to the size of a little nut. April 4th, she died, and autopsy showed tubercular pelvic peritonitis, evidenced by tubercular deposit, lymph, pus, firm old adhesions, ovaries imbedded in false membrane and nearly destroyed.

[I had often been struck by the great similarity between peritonitis and many of the cases of what, until enlightened by Bernutz, I had regarded as cellulitis, and by the fact that they occasionally ran into general peritonitis without any apparent emptying of purulent collections into the peritoneal sac, but I never had an opportunity of examining such a case post-mortem until the following presented itself:

Mrs. M——, aged thirty-five, married, but never pregnant, had been under my care during the winter at the Woman's Hospital for anteflexion of the uterus, the result, as I supposed, of peri-uterine cellulitis. August

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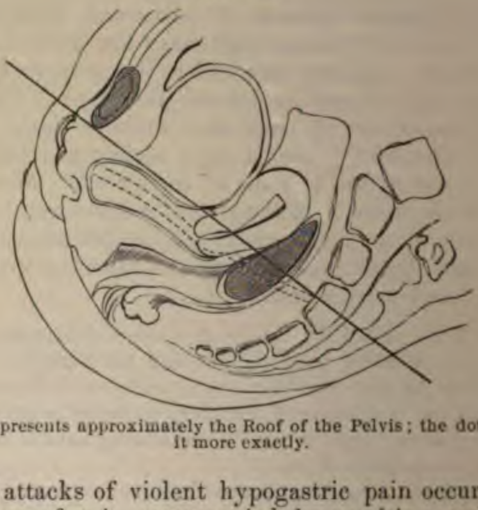
[1] I have rejected a number of the cases reported, because not sufficiently conclusive.

6th, I was called to see her in consultation with Dr. Roth, her family physician, and found her suffering from severe pelvic pain, constant vomiting, and fever. Upon vaginal touch I found the uterus immovably fixed and the pelvic roof as hard as a board. The pelvic tissue was everywhere hard and resisting, and the physical signs of what I had habitually styled cellulitis were present. About a week afterward the patient died suddenly and unexpectedly, and I made an autopsy in presence of Drs. Roth and J. C. Smith. No general peritonitis existed; the left ovary presented a sac the size of a hen's egg, filled with pus; the pelvic peritoneum was intensely inflamed, and the uterus bound down by old false membranes, bands of which matted all the parts together. The vermiform appendage was bound to the right ovary and the caput coli just below the uterus. No trace of inflammation could be discovered in the pelvic cellular tissue, except, of course, that in immediate contact with the ovary.

The fixation of the uterus, observed during life, was due to lymph effused upon the pelvic peritoneum, and no trace of inflammatory action in the pelvic areolar tissue could be discovered as accounting for it. It is true that the left ovary, enveloped by the layers of the broad ligament, was inflamed, and that a certain amount of inflammation existed in the cellular tissue immediately surrounding it, but this did not extend.—T. G. T.]

Frequency.—A reference to the autopsic notes of cases of cellulitis —for example, those recorded by West, Nonat, Aran, and McClintock —will give abundant evidence of the almost universal attendance of this complication upon it. But even without the existence of that, disease Aran found it in greater or less degree in 55 per cent. of cadavers of women examined in his service. This proves that peritonitis, limited to the pelvic viscera, is a common affection and one which is very generally overlooked. It is probably to its occurrence that are due so many of those attacks of violent hypogastric pain occurring with menstruation or just after it, accompanied by vomiting and slight febrile action, and which are generally treated by domestic remedies and viewed as cramps or uterine colic.

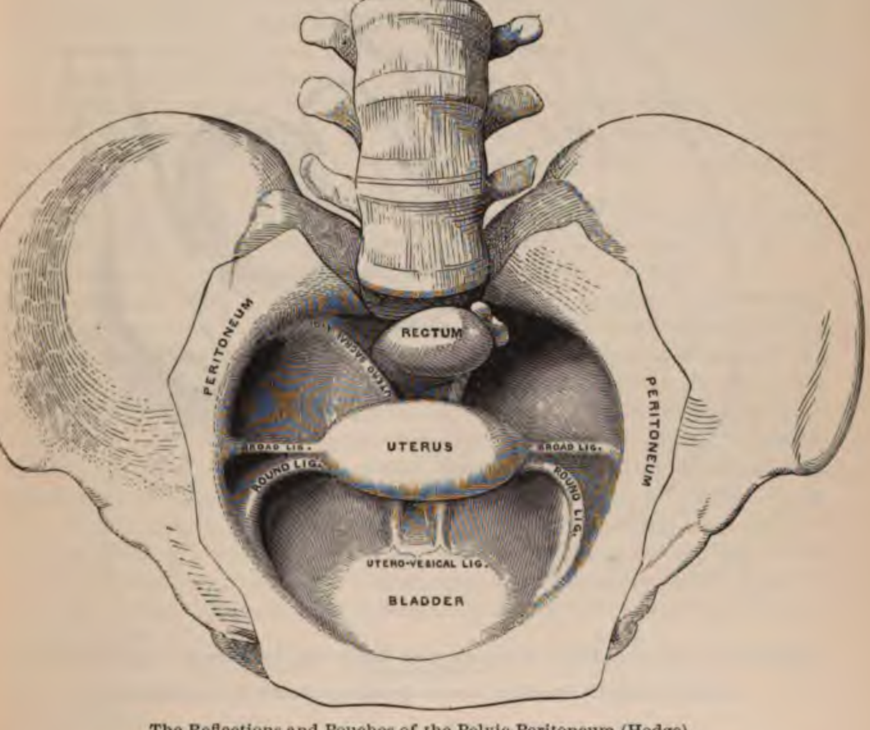
Fig. 236.



The straight line represents approximately the Roof of the Pelvis; the dotted line represents it more exactly.

Pathology.—The disease runs its course here, as peritoneal inflammation does elsewhere, in three stages. In the first there are simple engorgement and turgescence of the vessels, producing redness, dryness, and pain. In the second stage an entirely different state of things will be found to exist, to comprehend which fully the reader must bear in mind what is meant by the "roof of the pelvis." If a plane be passed backward from a point just under the pubic arch, through the cervix uteri at the attachment of the vagina, to the sacrum at the attachment of the utero-sacral ligaments, it will correctly represent this roof, which is thus formed by the vesico-vaginal septum, the lower extremity of the uterus—which projects, as it were, through a hole in the roof—the upper part of the fornix vaginæ, and the utero-sacral ligaments. Above the plane the organs of reproduction float, as Nonat expresses it, "in an atmosphere of cellular tissue." Let the reader suppose that, instead of this yielding, springy tissue, these organs were fixed in their places by having a fluid mixture of plaster of Paris poured around, among, and over them, which had afterward become solid, and he may form a correct idea of what vaginal exploration will yield to the sense of touch in the second stage. The roof of the pelvis is hard, ligneous, and as if composed of a "deal board," to which

FIG. 237.

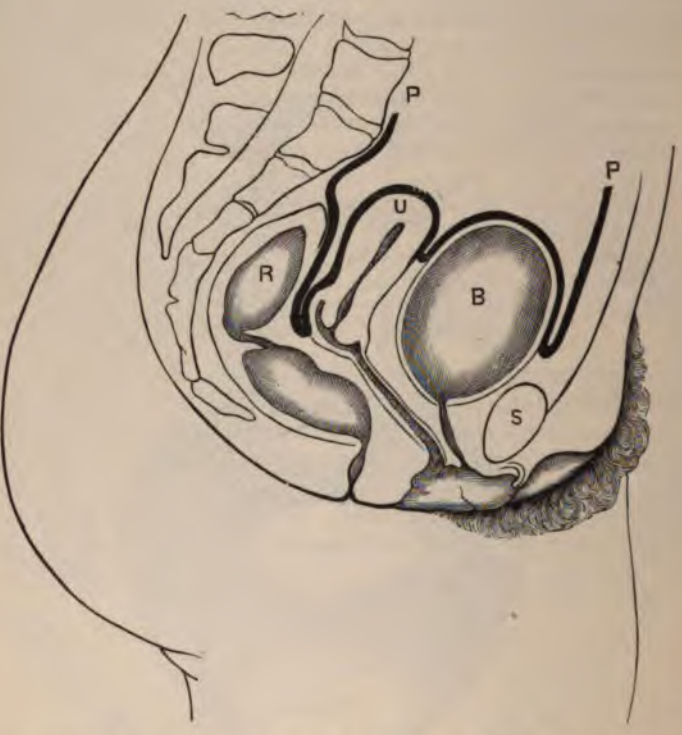


The Reflections and Pouches of the Pelvic Peritoneum (Hodge).

Professor Doherty likens it. The uterus, which is generally much displaced, is immovable, and all its appendages appear fixed by some solid surrounding element.

This, the second stage, consists in a collection of plastic lymph on

FIG. 238.



Perpendicular Section of Pelvic Cavity, showing Extent and Relations of Pelvic Peritoneum (Spiegelberg).
P, P, peritoneum; *R,* rectum; *U,* uterus; *B,* bladder, distended; *S,* symphysis pubis.

the surface of the peritoneum, and of serous, purulent, or sero-purulent fluid in its most dependent parts.

In the third stage the fluid, if serous, is absorbed; if purulent, discharged, and the exuded lymph undergoes organization and subsequently contraction. This binds the uterus, its appendages, and some of the intestines together in a mass which yields all the physical signs of a tumor.

Causes.—Its causes are the following:

Para-uterine cellulitis;
Parturition or abortion;
Gonorrhœa;
Endometritis, ovaritis, or salpingitis;
Escape of fluids into the peritoneum;
Traumatic influences;

Imprudence during menstruation;
Tuberculous or cancerous deposit.

Its frequent dependence on the first needs no further mention.

As a result of parturition or abortion it is so well known as to make the exhibition of proof here almost unnecessary. Reference may be made, however, to 53 autopsies by Aran,[1] in which, out of 38 women who had borne children, 24 presented evidences of its previous existence, while out of 15 who were nulliparous only 5 did so.

Gonorrhœa, by passing into the uterus and through the Fallopian tubes, is a fruitful source of the affection. According to Bernutz, 28 out of 99 of his cases had this origin. We have seen a number of severe cases due to it, and the great importance attached to this cause by Noeggerath is elsewhere fully stated.

It would be strange if endometritis and salpingitis did not, at times, cause oöphoritis and pelvic peritonitis. That they frequently do so is abundantly demonstrated by autopsies made after their existence both in the puerperal and non-puerperal states.

Salpingitis causes it, not only by the extension of inflammation along the mucous into the serous membrane, which is continuous with it, but by emptying its accumulated pus into the peritoneal cavity.

Escape of fluid into the peritoneum is an undisputed cause of this, as of general peritonitis. [I myself produced a well-marked case, which almost terminated fatally, by injecting a solution of persulphate of iron into the uterine cavity. The passage of the fluid through the tubes could not be questioned, for agonizing pain came on in less than three minutes, and continued up to the development of inflammation.—T. G. T.] This danger has caused the almost entire abandonment of intra-uterine injections on the part of the majority of practitioners, unless the cervix be previously dilated by tents. But many other sources from which fluid may enter the peritoneum exist; as, for example, rupture of an ovarian cyst, discharge of tubal dropsy or of a pelvic abscess, intra-peritoneal hemorrhage, regurgitation of obstructed menstrual blood, etc.

Traumatic agencies, as blows, falls, injury during labor, punctures, etc., may result in partial, as they do in general, inflammation of the peritoneum.

During the performance of menstruation, a physiological function which involves ovarian rupture and produces hemorrhage, which must pass to the uterus by a narrow tube not permanently in immediate contact with the ovary, any degree of exposure must evidently tend to inflammation in the investing peritoneum. Of Bernutz's 99 cases, 20 were thus produced.

Tubercles deposited in the part, either on the peritoneum or in the tissue of the tubes or uterus, may, as they do elsewhere, result in secondary inflammation; and cancerous or cancroid degeneration would be still more likely to produce the same result.

In certain peculiar states of the system this affection is excited by the most trivial circumstances, and very commonly the physician is held to a severe account for the fatal issue of an affection which he as little expected to arise from his interference as the friends of the patient did. We have seen it excited by the passage of the uterine sound, the use of a small sponge tent, and in one case from the passage of water, used by vaginal injection, into the uterus. Dr. Barnes, in his late excellent work on the *Diseases of Women*, says: "I have seen fatal peritonitis follow the simple application of nitrate of silver to the cervix uteri." It should be the duty of every physician to shield an unfortunate brother practitioner by the protection which these facts legitimately afford him; but it should equally be the duty of each to remember this paragraph, the whole of which is italicized in Dr. Savage's work upon the *Female Sexual Organs:* "No surgical proceeding whatever touching any part of the uterine system should be unattended by the precautions observed in operations of a grave character there or elsewhere; in certain states of the general system, unforeshadowed by any recognizable peculiarity, the most trivial operation has been speedily followed by fatal peritonitis."

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[1] *Op. cit.*, 718.

Varieties.—This affection may assume either an acute or chronic form, though when it constitutes the principal disease it generally, in the beginning, presents the features of the former. When it occurs as a complication of tuberculosis or uterine disease, it often assumes from the beginning the chronic type. Besides these varieties there are two others which cannot be passed without notice—menstrual pelvic peritonitis, which becomes aggravated at periods of ovulation, and recurrent peritonitis, which lasts for many years, giving, however, immunity for long periods, and then recurring with great violence from a trivial cause. We have had many such cases, one of which lasted ten and another eight years. For eight, ten, or twelve months these patients enjoy an almost absolute immunity from the disorder; then, excited by some apparently insignificant cause, a severe and excessively painful attack comes on. Sometimes these attacks are complicated by cellulitis, and a purulent accumulation frequently discharges itself through the pelvis as a consequence of them.

Symptoms.—The acute form shows itself by—

Pelvic pain and tenderness;
Sometimes great vesical irritation;
Usually increased thermometric range;
Nausea and vomiting;
Anxious facies;
Mental disturbance;
Tympanites.

When a severe acute attack sets in, it may cause either a chill or a sensation of coldness so slight that the patient will not recall its occurrence unless her attention be specially directed to it, or pain and fever may show themselves without this symptom.

Pain is at times only moderate, but at others most severe. It may occur in paroxysms, which create the greatest agony and prostrate the patient by their severity. We have seen it amount to agony equal to that arising from the passage of a biliary calculus, causing the patient to roll in bed, seize the bed-clothes in the teeth, and cry aloud most piteously. As a rule, it is not so violent as this. Pain may show itself quite early in the disease, or it may be preceded for several days by pelvic uneasiness and weight.

Tenderness over the whole hypogastrium accompanies it to such a degree that even the weight of the bed-clothes is intolerable, and the patient, to relieve it, lies upon the back with the legs flexed in order to relax the abdominal muscles.

The pulse shows in slight cases very little, and in severe cases a considerable amount, of febrile action. It is small and wiry, and increases in rapidity to 110 or 120 to the minute.

The thermometric range is likewise variable. In the beginning of an attack, which may become a severe one, the range may be normal or even below the normal standard. "Subnormal temperatures are especially common in peritonitis," says Wunderlich, "and always suspicious: death may follow them closely. High and rising temperatures do not add, *per se*, arguments for an unfavorable termination, although adding another dangerous element to the case. It is not so much the actual height as its constancy which must be feared, as are, also, great and irregular fluctuations between very high and very low temperatures." When, however, a case commences with a temperature of 106°, it is greatly to be feared that it will run a violent and dangerous course. On the other hand, even a normal temperature should not give complete security, although a decidedly favorable augury may usually be drawn from it. In general terms it may be said that for him who implicitly trusts to the revelations of the thermometer in this affection it will prove an unreliable guide; but to him who looks upon them merely as aids to diagnosis and prognosis it will give decided assistance.

Nausea and vomiting are common symptoms, though they do not generally exist to such a degree as to prove very annoying.

The facies is peculiarly anxious, and is sometimes rendered very striking by the appearance of dark circles around the eyes.

We have generally noticed in acute cases that the mind is markedly disturbed, as if the patient instinctively dreaded some serious disease, and even in chronic cases there is a decided tendency to slight mental alienation. In several cases we have seen this advance to absolute insanity.

It may be justly observed that these are the symptoms which mark general peritonitis. This is true; it is merely the slighter degree of severity and the localization of pain and tenderness which will point to the partial nature of the affection.

With reference to general peritonitis, it may be stated that, on the one hand, it, of all diseases, may declare itself by the most numerous and characteristic symptoms, or, on the other, run its fearful course with the greatest obscurity, so as to mislead the most careful diagnostician even up to its latest stages. If this be true as to the general disorder, how much more must it be so as to the local! Thus it is that we find the subacute and chronic forms passing off without recognition, and the fact that they have existed is known only by the discovery of firm adhesions over the whole pelvic roof in post-mortem examinations. In these varieties there are less pain and tenderness and less tendency to nausea and febrile action than in the acute. Sometimes, indeed, there is merely a sense of local discomfort, increasing to pain at menstrual periods, accompanied by fever toward evening, by difficulty in locomotion, and by a general sense of feebleness and malaise. This remarkable absence of symptoms in pelvic peritonitis was announced by Aran, and Dr. Duncan[1] expresses himself upon it in these words: "I might adduce cases of gonorrheal ovaritis commencing in healthy young girls, and ending in the fusion of all the parts in the pelvis into a solid, immovable mass, without the patient losing a cheerful and even gay visage, or making any great complaint of pain, unless interrogated closely, and then alleging the chief suffering to be from irritable bladder."

We ourselves have examined many women, married and unmarried, parous and nulliparous, in whom a rigid vaginal vault, immovable uterus, and adherent ovaries and tubes unquestionably denoted the previous occurrence of pelvic peritonitis, but who absolutely denied any knowledge of such an illness or of ever having spent even a day in bed. The only thing they had to complain of was deep-seated pelvic pain of a more or less intermittent character existing for one or more years, or present at some previous time and followed by gradual relief.

Physical Signs.—Should an examination be made during the first stage, nothing will be ascertained but the existence of sensitiveness upon pressure in the vaginal cul-de-sac and upon lifting the uterus. Tenderness will likewise be demonstrated by pressure on the hypogastrium. None of that doughy, œdematous, puffy feel which accompanies cellulitis will be discovered by vaginal touch. Should the disease run its course as one of those very insignificant attacks which produce no grave symptoms and are scarcely recognizable, no other physical signs will present themselves at this or any other period. Should it be one of graver character, a sense of resistance merely, or a tumefaction like an ill-defined tumor, may be felt in the recto-vaginal space or at the side of the uterus. Or if very little lymph and much sero-pus have been the result of inflammatory action, a sense of fluctuation may be detected very early. The uterus is always more or less interfered with in its mobility, and in severe cases it is absolutely fixed. This explains how Lisfranc and Boivin applied to it the name of "fixity" or "immobility" of the uterus.

We have stated that a tumor is commonly felt posterior to, or at one side of, the uterus. This tumor, which is formed by agglutination of the pelvic and abdominal viscera, is extremely sensitive to touch.

If the disease go on to formation of pus, the sense of tumefaction may disappear as this discharges itself; but if the effused lymph becomes thoroughly organized, it remains hard and resisting for a length of time. This accumulation almost invariably displaces the uterus, sometimes by pressing it in an opposite direction, sometimes by drawing it toward itself as the lymph contracts.

[In a case which I saw some years ago with the late Prof. G. T. Elliot we were much puzzled for a short time before its fatal issue by the existence in the fornix vaginæ of a pouch apparently filled with fluid, all the surrounding parts being unattached and no sense of tumefaction or resistance being discoverable. The patient died suddenly from general peritonitis, and upon post-mortem examination, conducted by Prof. J. W. S. Gouley, we found, first, a small piece of fetid placenta *in utero*, the result of a recent abortion; second, an abscess of the right ovary, which had created general peritonitis by emptying itself into the peritoneum; and, third, pelvic peritonitis, which had evidently existed for more than a week. It had created a purulent collection in Douglas's cul-de-sac, which was limited to this space by false membranes that formed for it a complete roof. This accumulation it was which gave the sensation above described.

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[1] *Perimetritis and Parametritis*, p. 78.

In another case, sent to me by Prof. J. C. Hutchinson of Brooklyn, the uterus was found firmly bound to the sacrum by a hard, resisting mass which was very sensitive. There was considerable corporeal endometritis, and I incautiously applied to the uterine cavity tincture of iodine, and as a result the most violent pelvic peritonitis developed itself, which almost became general. In ten days after its inception a soft, fluctuating pouch formed in the fornix vaginæ, which became so painful that I tapped it with an exploring needle and drew off about an ounce of clear serum, much to the patient's relief.—T. G. T.]

Course, Duration, and Termination.—In no disease can these be more variable and uncertain than in that under consideration. A great similarity exists between its phases and those of pleuritis. As in that affection we have shades of difference varying from the ordinary "stitch in the side," which results from inflammation of a portion of the pleura not larger perhaps than a silver half dollar, to empyema and tubercular pleuritis, which may continue till death by pulmonary consumption or pneumothorax closes the scene, so may we have in pelvic peritonitis like variations. It may run its course unobserved, leaving evidence of its existence only in adhesions found post-mortem. It may pass through its first two stages in three or four weeks, leaving the uterus permanently displaced by the continuance of the third. It may reappear with a certain amount of acuteness at menstrual periods, causing them to be very painful. It may, if due to tubercular deposit, continue so as to exhaust the patient slowly. It may produce a purulent collection, which, by emptying itself into the peritoneum through the adhesions thrown around it, may create general peritonitis, or this last may result from the spread of morbid action from the pelvic to the general serous membrane.

Differentiation.—The diseases with which this is most likely to be confounded are—

Para-uterine cellulitis;
Pelvic hematocele;
Fibrous tumors;
Fecal impaction.

Para-uterine Cellulitis.—Differentiation between these two affections is in some cases simple enough, but in others it is impossible. Difficulty will occur when cellulitis affects, and is confined to, the tissue most immediate to the uterus, but this we know to be very rare. Our suspicions will often be turned into the proper channel by the cause of the attack. Cellulitis will very rarely occur except after parturition, abortion, or an operation on the pelvic viscera. Peritonitis will usually result from exposure during menstruation, disease of the ovaries, or escape of fluid into the peritoneum. Should the attack occur as a result of gonorrhœa, it is probably due to serous and not cellular inflammation—a fact which the anatomical relations would lead us *a priori* to anticipate, and which is fully substantiated by statistics. West and Aran credit gonorrhœa with the causation of cellulitis in from 1 to 2 cases in 100, and Bernutz declares it active in 28 out of 100 of peritonitis.

Pelvic Hematocele.—From this it may be distinguished by the great suddenness of appearance of hematocele, absence of signs of inflammation in the beginning, presence of those of hemorrhage, and by the much greater dimensions of the tumor, which, unlike that of peritonitis, is at first rather soft and gradually becomes hard. The occurrence of free bloody flow will likewise point to hematocele, though such an occurrence, to a limited extent, often takes place in peritonitis. Hematocele often excites peritonitis, and thus both frequently exist together.

Fibrous Tumors.—These will generally be known by their producing no pain, presenting no sensitiveness on pressure, no sense of œdema, no signs of inflammation nor rapidity of development. They are likewise usually movable, and cause no fixation of the uterus.

Fecal Impaction.—After pelvic peritonitis and cellulitis have existed for some time, and have lost their features of acuteness, and more especially after opium has been long used to allay the pain which attends them, they are very apt to be complicated by fecal impaction. Not only is this a complication; we have known it exist long after the inflammatory affection which preceded it has passed away, and give rise to the belief that this still continues, the pain which it creates being attributed to the primary condition. We have met with several very striking cases in which, after four or five months of intense suffering from supposed peri-uterine inflammation, which was treated by free use of opium, we discovered great fecal impaction, the removal of which afforded complete and permanent relief. So frequent do we consider the development of this condition as a result and complication of peri-uterine inflammation, or as an independent state which is mistaken for it, that we never take charge of a case which has been under the previous treatment of others without examining for its existence, and in the management of cases from the commencement under our charge always carefully guard against its occurrence.

Importance of Differentiating Peritonitis from Cellulitis.—The importance of differentiating this disease from cellulitis rests in part upon the fact that it admits of less local interference. Sometimes the passage of a uterine sound, an application to the cavity, or even the use of a vaginal injection which by accident has entered the uterus, has been known to destroy life by causing peritonitis which has extended to the whole peritoneum. It is likewise important in reference to prognosis as to the course of the affection and its remote results. Lastly, it should not be forgotten that progress in the comprehension of the diseases of all organs must be preceded by a careful and systematic separation of them, one from the other. As the study of acute cardiac affections under the common name of carditis could never have accomplished what that of each of its varieties has done, so could not investigation of these affections undivided into their proper classes.

Prognosis.—If the case follows parturition or abortion, the prognosis will be rendered graver by that fact. Otherwise it will be governed in great degree by the general symptoms. Should these show great intensity of inflammation, and constitutional disturbance be evidenced by excessive nausea and vomiting, quick pulse, anxious facies, etc.—in other words, should the symptoms point to the probable spread of the disease over the whole serous sac—the ordinary prognosis of peritonitis may be made. In cases of chronic type occurring in the non-puerperal state it is decidedly favorable, unless the disease exist in a scrofulous or tuberculous patient or show a tendency to severe periodical relapses. Another fact which will increase the gravity of prognosis is the existence of purulent effusion in place of lymph and serum as the result of the inflammatory action. Seeing, as we do, between 500 and 1000 cases of pelvic peritonitis every year, our experience is that so small a proportion terminate fatally, at least in consequence of the results of the acute attack, that we are inclined to place the mortality at a very low figure, and therefore usually give a favorable prognosis. It is, however, always prudent to guard ourselves by warning the friends that the occurrence of suppuration or of a repetition of the acute symptoms may require operative interference, and may possibly terminate disastrously.

Results.—The common results of the disease, which remain long after it has passed away or perhaps permanently, are—injury of the ovaries by abscess or atrophy; obliteration or dropsy of the Fallopian tubes; and fixation of the womb in malposition by organization of false membranes. As consequences of these lesions follow, very naturally, amenorrhœa, dysmenorrhœa, and sterility.

Treatment.—Pelvic peritonitis usually announces its advent by severe pain, elevation of temperature, rapidly of pulse, and other symptoms which leave the practitioner in no doubt as to its development. The rule of treatment should be based upon the following indications: first, entire prevention of pain during its course; second, complete control of the temperature; third, the strict observance of absolute quietude. The patient's prospect for life and for escape from the chronic results of the disease if recovery occurs will greatly depend upon the thoroughness with which these indications are fulfilled.

In the very commencement of the attack pain should be relieved by opium administered by the hypodermic syringe, the mouth, or the rectum. The first method is an excellent one to begin with, but its frequent use is so apt to engender a morbid taste that it is better after pain has once been completely subdued to continue the narcotic influence by opium or morphia by mouth or rectum.

Formerly, following the precepts of the late Dr. Alonzo Clark of this city, opium was considered the sheet-anchor in all cases of peritonitis, general or local, and was administered not only for the purpose of relieving pain, but also in order to quiet the movements of the intestines, and thereby, as it was supposed, check the progress of the inflammation. Undoubtedly, this practice was excellent for a time, but it had its objections in that the constipation induced by the steady administration of opium required the use of strong cathartics later on, by which a fresh inflammation was very liable to be lighted up, not to mention the accumulation of gas and the reflex gastric disturbance which the arrest of intestinal action produced. Of late years our practice in this respect has diametrically changed, since we now have substituted the administration of mild laxatives, such as small doses of calomel frequently repeated, followed by saline laxatives as soon as tympanites or the first symptoms of peritoneal inflammation manifest themselves. It is a fact now beyond dispute that the relief of tympanites produced by a free evacuation of the bowels will almost invariably cut short an incipient attack of peritonitis, as evidenced by the falling of temperature, the cessation of vomiting, and the general improvement of the patient. We therefore nowadays find that our patients do best by keeping the bowels moderately loose through the administration of gentle laxatives or daily warm water and glycerin or sweet oil, or if necessary oxgall, enemas; pain, of course, following such evacuations being relieved by the moderate use of opium.

In a certain number of diseases death is in great degree due to the very high temperature which attends them. Examples of such are sunstroke, typhoid fever, septicæmia, and peritonitis. In all these the greatest advantage results from keeping the temperature at or near the normal standard. This being done, the altered blood-state and its remote influences upon the tissues composing the nervous system and important viscera, which result from an exaltation of the animal heat, are avoided, and thus, although death may come through some other avenue of approach, this one is obstructed.

It is seldom in local peritonitis to find the temperature so persistently high as to be a serious cause for alarm. As a rule, it varies between normal and 103°–104° F., changing several times during the twenty-four hours, usually reaching the higher figure toward evening; but no certain estimate of temperature can be given for a case of pelvic peritonitis, since it may be normal for several days; then, with or without fresh accession of pain, rise to 103° or more, remaining near this point for several days, and then again, under appropriate treatment, dropping to near the normal figure. Such rapid rises of temperature usually indicate, in the early stages of the disease, a fresh exudation; that is to say, a more or less marked increase of the inflammation. This may not always be susceptible of recognition by the examining finger. In the later stages such fluctuations of temperature, especially if accompanied by more or less pronounced rigors and perspiration, may indicate the development of suppuration in the exudation.

This condition of things may continue for weeks, and even months, and completely exhaust not only the patience and endurance of the patient, but also the resources of the physician.

According to the degree of temperature—that is to say, if it exceeds 102° F.—the necessity for controlling and subduing it arises. This might be done by lowering the temperature of the whole body through cold affusion, cool baths, or the cold pack; but in cases of protracted illness we must avoid the risks of sudden and excessive reduction of temperature; hence we have abandoned at present all violent methods of lowering body-heat, and have limited ourselves to the measures which control the local inflammation and thereby indirectly the general rise of temperature. The application of the rubber ice-bag (preferably that known as the German ice-bag covered with mackintosh) or of the ice-water coil, or in milder cases of cold compresses frequently repeated, constitutes the limit of the local antiphlogistic measures. We have already stated, in the chapter on General Therapeutics, our views on the reduction of temperature by means of medicinal agents; suffice it to say here that the careful administration of antipyrine, antifebrin, or phenacetin whenever the temperature seems to demand their use is the rule with us, and forms in our opinion an invaluable method of reducing temperature and giving the patient time to recover from the disease.

The application of leeches to the abdominal skin over the seat of the exudation is a favorite means in the hands of many prominent practitioners for checking the spread of the exudation and relieving the high temperature. We can sanction their employment only at the very outset of the disease, when possibly they may entirely abort it; but, unfortunately, we seldom have the opportunity to see the cases early enough to warrant the remedy; besides, unless carefully watched, more blood may be lost after the leeches have been removed than is desirable.

Perfect quietude should be observed. Not an approximation to it, but a stillness which should interdict the action of every voluntary muscle. A nurse should watch the patient night and day, anticipate every want, and supervise every function. The patient should not converse with her, and no one else should be habitually in the chamber. It is well to keep the bladder empty by the catheter if urination is not easy. Milk, beef-tea, and other plain, nutritious, and unstimulating food should be prescribed, but no solid food should be allowed.

In the second and third stages, where lymph has been the chief and perhaps the only product of inflammation, we must rely upon counter-irritants, and we know of none to be compared with the blister. One made of Spanish flies, four by six inches in dimensions, should be applied over the hypogastrium, and the abrasion which it produces dressed with savine ointment. As soon as it heals entirely another should be applied directly over the newly-formed skin, and this may be repeated every ten or fourteen days with great advantage. We have known patients who dreaded them in the beginning beg for them after experiencing the relief which they gave. The blister is to pelvic peritonitis in its later stages what it is to pleuritis, the most rapid and efficient of remedial agencies. In place of the blistering plaster, which often causes very severe pain, the cantharidal collodion may be painted on the abdomen over the exudation twice a day, until the desired vesication is produced.

Another very excellent method for producing counter-irritation is by tincture of iodine painted over the hypogastrium once in twenty-four hours for weeks.

As soon as a thorough blister has been raised, flaxseed poultices, prepared as hot as the patient can bear them, should be applied and continued as long as the persistence of the exudation requires. It is our rule to have them applied so hot as to produce ecchymoses of the skin, covering them with oil-silk and flannel in order to prevent too speedy evaporation. The more thorough the blistering and the hotter and more persistent the use of the poultices, the sooner will the absorption of the exudation take place. This treatment is applicable, of course, only to those cases where the exudation can be felt through the abdominal walls, and not to those where it is situated deep in the pelvic cavity and accessible only through the vagina.

Treatment of Chronic Cases.—The affection having passed into the chronic stage or originated with all the appearances of chronic disease, a different course of management becomes advisable. The patient should not be so strictly confined to bed nor dieted. She has entered upon an invalid course which may last for months or for years, and in making a strenuous effort to cure her local disorder we may sap her general health and do her irretrievable injury. On the other hand, she should not attend to her household cares nor take exercise to any great degree, but, remaining in bed or on a lounge most of the time, go out in the fresh air for an hour or two daily. Her diet should be of the most nutritious character, stimulants should be allowed in moderation, and the impoverished blood resulting from a combination of circumstances prejudicial to hematosis combated by change of air and the use of vegetable and mineral tonics, especially iron.

One of the most important questions in the management of chronic cases is that of the amount of exercise to be allowed and the strictness of confinement to be practised. No absolute rule can be laid down in reference to these points, for each case will call for special guidance based upon careful experiment. In general terms it may be stated that when motion does not produce pain or discomfort, the patient should ride in an easy carriage for two or three hours daily; in those cases which are still more free from local trouble she may walk with moderation; while in others which present elements of acuteness no motion whatever should be allowed. Sometimes the patient will even bear removal from home to the seaside or some watering-place during the summer. If this be so, a locality should be chosen that is accessible by easy travel. One great and ever-recurring difficulty in this connection arises from the great tendency of patients, allowed to take exercise, to commit indiscretions by overtaxing themselves. This becomes so great at times as to make it advisable to confine to bed one who would be benefited by moderate exercise, in order to avoid danger from her imprudence. The fact should never be lost sight of that the pelvic peritoneum forms a part, a sheath, as it were, of the suspensory ligaments of the uterus. The fibrous structure of the round, broad, sacral, and vesical ligaments is covered by it, so that dragging of the uterus upon them puts the peritoneum upon the stretch and strongly tends to excite renewed action there.

Of all influences which act in a directly prejudicial manner upon these cases, sexual intercourse is the most decided, and its strict limiion should be made one of the first rules laid down for their manement.

Should acute exacerbations occur in chronic cases, the use of local pletion is advised by high authority; but as a plan to be strictly rsued with reference to cure it is highly objectionable on account of spanæmia which it induces.

If it be deemed advisable to keep up the use of the iodide or omide of potassium—the results of which are, however, doubtful—ey may with advantage be combined with iron and vegetable tonics, in the following prescriptions:

℞. Potassii iodidi, ʒiij;
Ferri iodidi syr., ℥ij;
Tr. calombæ, ℥vj.—M.
A dessertspoonful (ʒij) in water three times a day.

℞. Potassii bromidi, ʒv;
Vini ferri dulcis, ℥iv;
Tr. calombæ, ℥iv.—M.
A dessertspoonful in water three times a day.

Should Collections of Pus or Serum be Evacuated?—The important bearings of this question are manifest, but unfortunately no definite answer can be given to it. In evacuating these collections the peritoneal cavity is not exposed to entrance of air, for a false membranous roof covers the collection, but there is always danger in perforating the delicate and easily inflamed serous sac. [I have elsewhere reported a case in which I drew off one or two ounces of serum under these circumstances, to the great relief of the patient, who rapidly improved and did well. It is not the only case in which I have ventured to invade the peritoneum under these circumstances.—T. G. T.] The safest rule for practice will be this: If in spite of the sero-purulent collection the patient be doing well and do not suffer from the local trouble, it should be left to empty itself spontaneously. [I do not agree with this advice on general principles, so far as it applies to the presence of pus. My opinion is that, pus being present and capable of evacuation without special trouble or danger, it should always be evacuated as soon as detected; and I have no doubt that this is really Dr. Thomas's opinion also.—P. F. M.] If, on the other hand, the patient suffer from the collection, be not progressing favorably, and the evacuation be perfectly practicable, it should be accomplished.

Methods of Evacuation.—Evacuation may be accomplished by the aspirator, a small trocar and canula, or by a guarded bistoury or tenotomy-knife. After evacuation the sac may be carefully washed out with a weak solution of carbolic acid in warm water or of tr. of iodine in the same menstruum.

[*Pelvic Lymphangitis and Lymphadenitis.*—That the lymphatic vessels and glands of the pelvic cellular tissue may become inflamed, and then give rise to symptoms similar to those of pelvic peritonitis and cellulitis, is to us unquestionable, and we confess our surprise that so little mention of this disease is made by modern authors. Lucas Championnière[1] of Paris in 1870 called attention to the close connection between pelvic lymphangitis and puerperal inflammations, and both he and Leopold,[2] then of Leipzic, described the complicated network of lymphatic vessels enveloping and penetrating the uterus, tubes, ovaries, pelvic peritoneum, and cellular tissue. But Courty of Montpellier was the first[3] to recognize the existence of a non-puerperal inflammation of these vessels and glands, and to elevate that condition to the dignity of a separate disease.

My attention was called to this subject by an article by Dr. J. S. Carreau[4] of New York, and I then recalled having met similar cases. A full description of this condition will be found in an article by me published in 1883.[5]

Causes.—These are the same as would produce an inflammation of the lymphatics in any other part of the body—viz. a traumatic irritation or a septic infection of an organ plentifully supplied with lymphatic vessels. Thus, injuries to the cervix and its cavity (laceration, curetting, caustics, or chronic catarrh of the cavity of the cervix, chancroid or septic infection) might produce a direct inflammation of the adjacent lymphatic vessels and glands.

Diagnosis.—In place of the large exudate and the immovable uterus found in pelvic cellulitis, the vaginal vault in pelvic lymphangitis will be felt to be puffy, doughy, and above it the finger will detect bunches of exquisitely tender, slightly movable cords, similar to varicose veins, with irregular, smooth nodules here and there, which are immovable and also exceedingly sensitive. These cords and nodules are felt either directly behind the cervix or on both sides, and are evidently situated in the cellular tissue. Several times I have found them quite high up on the posterior surface of the uterus, the mobility of which organ is but little affected in this disease.

Symptoms.—Deep-seated pain and throbbing in the pelvis, some rise of temperature in the early and acute stage, dyspareunia, are the chief symptoms.

The *treatment* consists in hot douches, tr. iodine, and glycerin to the vaginal vault, and glycerin tampons.

The *course* and *termination* of the disease, if it is properly treated in the early stage, are rapid recovery. When the inflamed glands have become indurated little can be expected from local remedies. A course of treatment by brine sitz-baths and douches would then probably offer the best chance for cure.—P. F. M.]

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[1] *Ut. Lymphatics and Ut. Lymphangitis, and the Part played by Lymphangitis in Puerperal Complications and Ut. Diseases*, Paris, 1870; and *Arch. de Tocologie*, 1875.

[2] *Arch. für Gynäk.*, 1873.

[3] *Annal. de Gynécol.*, April, 1881; *Maladies des femmes*, 1883.

[4] *N. Y. Med. Rec.*, July 2, 1881.

[5] "Non-puerperal Pelvic Lymphadenitis and Lymphangitis," *Am. Journ. Obst.*, Oct., 1883, pp. 24.

CHAPTER XXXIV.

PELVIC ABSCESS.

It would seem unnecessary to devote a special chapter to the consideration of pelvic abscess, which in the large majority of cases is a direct result of the inflammatory exudations described in the last two chapters, and which should therefore have been discussed under those headings. But suppuration often occurs in the Fallopian tubes and ovaries, and occasionally as the result of disease entirely unconnected with the pelvic organs, such as caries of the vertebræ, pelvic bones, inflammation of the psoas muscle, and all such accumulations of pus may be grouped under the one head of pelvic abscess. In order to avoid confusion we will say that we here consider only the abscesses caused by the suppuration of exudations in the pelvic cellular tissue, relegating the others to the chapters which treat of the diseases of the respective organs.

Definition.—A pelvic abscess in the ordinary sense of the word would mean an accumulation of pus in any portion of, or within any organ situated in, the pelvic cavity. This is the usual acceptation of the term, from which, however, as above stated, we have decided to depart.

Pathology.—There are four sources of pelvic abscess as ordinarily described: 1st, breaking down of tuberculous material deposited in any of the tissues of the pelvis; 2d, suppurative action taking place in the walls of a cavity formed by an hematocele or ovarian cyst; 3d, inflammatory suppuration in the ovaries, the tubes, the pelvic peritoneum, or the parenchyma of the uterus itself; 4th, inflammatory suppuration in the para-uterine cellular tissue.

The first source is very rare, and distinguishable only by the history. The second and third sources are considered under their respective headings. Abscess of the uterine tissue is rare and usually puerperal. We shall here discuss only the fourth variety, which is not uncommonly met with, and is most generally the result of cellulitis occurring after parturition or in the non-puerperal state. Under the latter circumstances cellular inflammation may be primary, or secondary to irritation from some foreign body, as the débris of an extra-uterine fœtus, a hard substance in the vermiform appendix, a fibrous tumor of the uterus, or caries of the pelvic bones.

Causes.—Any influence which induces cellulitis or either of the other two pathological conditions mentioned may prove immediately causative of abscess. As remote causes may be mentioned the tuberculous and scrofulous diathesis; great depression of the vital energies from any cause, as impure air, like that of a hospital; the puerperal state; and pyæmia.

Symptoms.—These will not differ essentially from those of abscess elsewhere. When pus is forming, violent chills, followed by fever, with profuse sweating, are likely to occur. Then a feeling of prostration with throbbing pain in the pelvis, pressure upon the rectum and bladder, and sometimes interference with urination, presents itself. Pain down the thigh, which may be mistaken for sciatica, will also at times be noticed.

Physical Signs.—By abdominal palpation, combined with rectal or vaginal touch, a fluctuating tumor will be felt, presenting the ordinary physical signs of purulent collections elsewhere.

Course, Duration, and Termination.—Pelvic abscesses may evacuate themselves through any part of the floor of the pelvis, through its roof into the peritoneum, through any one of its walls by means of foramina, through any of the pelvic viscera, or by several of these channels at the same time. They may open by free outlet or by a long, sinuous tract, which renders prognosis as to cure extremely grave. The most favorable points for evacuation are through the vagina and rectum. Next to these comes, in point of favorable prognosis, evacuation through the abdominal walls. [In the *Charleston Medical Journal* for 1853 I published a fatal case of rupture into the intestine and bladder, with autopsy.—T. G. T.] Sometimes, when left to themselves, these abscesses will go on to recovery without delay, opening into and discharging themselves through some of the parts mentioned, and gradually contracting and disappearing. Sometimes, if deprived of the assistance of art, they may burrow deeply into the tissues, open by long, fistulous tracts into some organ, as the large intestine or sigmoid flexure, or discharge into the peritoneum, or honeycomb the pelvic cavity.

König has instituted some very interesting experiments on the cadaver to show the most probable routes which these accumulations may take:

1st. Injecting air or water beneath the peritoneum near the ovary or tubes, the injection ran along psoas and iliac muscles into pelvis.

2d. Beneath lateral ligament near cervix, it filled the same side of pelvis, ran along round ligament toward Poupart's ligament and to the iliac fossa.

3d. Beneath broad ligament behind cervix it filled posterior and lateral part of pelvis, and passed along psoas and iliac muscles into pelvis.

Sometimes, even when the opening at first is large, it contracts so as to allow only an imperfect discharge of the contents of the sac. Then hectic fever arises, and the patient either leads a miserable existence for years from the constant fetid flow or is worn out by exhaustion or septicæmia. At other times these collections of pus will remain imprisoned for a long period without any attempt at escape.

Differentiation.—The morbid states with which this condition may be confounded are these:

Pelvic hematocele;
Extra-uterine pregnancy;
Displaced ovarian cyst;
Pyo-salpinx.

The first of these, being a hemorrhage, gives certain symptoms characteristic of that accident, as prostration, coldness of the surface, suddenness of appearance, etc., and absence of chill, heat, fever, and other signs which are likely to accompany abscess.

With the second the signs of pregnancy exist, and as early as the fourth month fœtal movements may be detected, while the perfect health of the patient, with absence of menstruation, will excite suspicion as to the character of the affection.

Around abscesses, even of tubercular character, there is always a wall of lymph thrown up which would not be present in a displaced ovarian cyst. All the rational signs of suppuration would likewise be absent in the latter.

Accumulation of pus in the Fallopian tube is always the result of inflammatory action affecting the lining membrane of the organ and closing both the uterine and ovarian extremities. The fluctuating tumor thus produced may be slender and small, or it may acquire the size of an ordinary breakfast sausage or become a globular, more or less distended, mass. It may be loose or it may be adherent to the bottom of Douglas's pouch. Errors of diagnosis are not infrequent, and often only the most experienced touch is able to differentiate between an intra-peritoneal abscess—that is, one situated in the ovary or Fallopian tube—and one located in the pelvic cellular tissue. The aspirator will enable the operator to ascertain whether the mass contains pus or some other fluid. As regards the prognosis and treatment, it is of the greatest importance that the intra- or extra-peritoneal location of the abscess should be determined. A serous accumulation in the Fallopian tube may simulate a pyo-salpinx, but does not present the history of inflammation and suppuration characteristic of the latter.

Prognosis.—The prognosis will depend upon the following circumstances: It will be favorable if the abscess be superficial, point upon a mucous tract, open low down in the pelvis by free exit, and give forth pus which has no offensive odor. Should it be deep-seated, open by a long tract, give forth fetid pus, open high up and by two points of exit —as, for example, the bladder and bowel—the prognosis is decidedly unfavorable, unless the case can be so affected by surgical interference as to change its character.

Treatment.—Nothing can be done in these cases by specific medication, by which we mean that directed especially to relief of the existing morbid condition. All of our efforts should be directed to supporting the vital forces, which are always much prostrated by the process of suppuration. The patient should take the most nutritious diet, as much animal food as she can digest, eggs, milk, fresh vegetables, and malt liquors. Whiskey or brandy should be allowed her, and the blood-state should be improved as much as possible by vegetable and mineral tonics. Those most especially suited to the condition are preparations of cinchona and of iron, as, for instance, the following pill:

℞.	Quiniæ sulphat.,	℈ij;
	Ferri sulphat.,	℈j;
	Acid. sulph. arom.,	gtt. x;
	Mucilag. acaciæ,	q. s.—M. et ft. pil. No. xx.

S.—One to be taken three times a day before meals.

But it is to surgery that we must look most confidently for aid, and in this connection arises the important question as to the propriety of opening such abscesses, the best point for evacuation, and the time for interference.

Should an abscess in the pelvis show a rapid tendency to point and discharge through a favorable channel, at the same time that no distressing or dangerous symptoms show themselves, it would be the part of wisdom to await the action of nature, for all must admit that there are few localities in the body into which it is more hazardous to cut than this. Even under these circumstances, however, there is danger in delay. Sir James Simpson relates a case which he saw with Dr. Ziegler one day when the abscess pointed decidedly toward the vagina and rectum very low down. Feeling sure that it must soon discharge, they left it till the next day, but before that time, to their surprise, it had burst into the peritoneum. This danger, as evidenced by statistics, is not great, and, as experience goes to prove that the knife is often employed too early rather than too late, I should strongly recommend the delay of surgical interference until the presence of pus is an absolute certainty. If it be thus delayed, the tissues intervening between the pus and point of introduction of the instrument become broken down, and a tract of sinus is avoided; if two or three abscesses exist near each other, we give time for them to coalesce; and the mass of lymph poured out is liquefied by the suppurative process. Should evacuation be resorted to too soon, all these advantages will be lost.

Let us suppose a different case, that the patient is suffering grave constitutional signs from the abscess. The answer to the question of the propriety of interference resolves itself into this: if the pus can be certainly reached, it should be evacuated. Should the abscess be deeply seated, on the other hand, so as to make the operation difficult and uncertain, it would expose the patient to hazards greater than those attendant upon delay.

Dr. Savage believes that "puncture should be practised early and *per vaginam.*" Spencer Wells declares, from an experience in opening as many as from twenty to thirty pelvic abscesses, that he has known of no fatal result. "I have known," says he, "several cases of death where no puncture has been made—some of them very painful cases—when I had urged puncture and was overruled." As a rule he punctures *per vaginam.*

Prof. Brickell of New Orleans has recently taken strong ground in favor of the early evacuation of pelvic accumulations, and, as we especially desire to lay before the reader an unbiassed view of the present state of professional opinion upon this important subject, we give his conclusions in full:

"1. I have no doubt at all that there are two distinct forms of pelvic inflammation—serous and phlegmonous or suppurative. An attack of either may be abortive—that is, may fail to result in formation of pus or effusion of serum. But, should either pus or serum be deposited, then—

"2. I am sure that evacuation is the proper practice; and

"3. Either should be evacuated *per vaginam.*

"4. The presence of pus in any portion of the body is not to be tolerated by the surgeon. I contend that the presence of effused serum in the pelvis is not to be tolerated either. As long as it is present in addition to the pain and prostration present, there is the abiding stimulus to repeated inflammations, and the pelvis can and will be ravaged.

"5. Topical applications and internal remedies have no influence on pelvic and serous effusions, according to my observation."

For our part, we feel very sure that this subject is one upon which no fixed rule can be given. The surgeon must weigh the dangers of operation with those of delay, and decide by the indications presenting in each individual case. Were the determination of the existence and locality of purulent accumulation really as easy at the bedside as one might be led to regard it from the literature of the subject, we should strongly advocate a uniform resort to evacuation. But this not being by any means the case, we are induced to do otherwise. Nor must it be imagined that seeking for pus hidden away in the pelvic areolar tissue is an entirely safe procedure. The following fatal case, due, in all probability, to an entrance of air into the veins, will prove interesting in this connection:

"In the case reported[1] aspiration some three months before, for the removal of a quantity of pus from the pelvis, had been followed by much relief. The symptoms having returned, the needle was again introduced through the vagina to the left of the uterus, a distance of three-fourths of an inch. As soon as the pumping was commenced the patient manifested pain, became convulsed, and grew purple. Congestion of all the superficial veins followed, though the needle was immediately withdrawn as soon as the symptoms began, when no more than four or five strokes had been made. In three minutes the patient was comatose, and in ten minutes the heart ceased to pulsate.

"The autopsy revealed a small punctured wound on the left side of the vagina one and a half inches before its juncture with the uterus. The probe passed upward and to the left three-fourths of an inch in the direction of a soft tumor in the uterus. Around the track followed by the probe was no more than a teaspoonful of clotted blood. A close network of small veins was traversed by the puncture just outside of the vagina, but after the most diligent search it was seen that no important blood-vessel had been touched. The areolar tissue about the uterus contained air. The left lung was much congested. The right chambers of the heart were filled with air and contained no blood. The left chambers were empty. The valves were normal. The veins of the stomach were distended with air, presenting the appearance of pale round-worms."

The Best Point for Evacuation.—To whatever surface the point of the abscess is nearest, that will, as a general rule, be the best for its evacuation. If there be a choice, the locations at which it will most likely point should be chosen in this order: 1st, the vagina; 2d, the rectum; 3d, the abdominal walls.

Dr. Savage reports the points of opening, artificial or spontaneous, in 19 cases; they were as follows:

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[1] *Boston Med. and Surg. Journ.*, vol. cii. No. 17.

1 above pubes at median line.
1 midway between navel and pubes.
1 outside left saphenous opening.
2 by rectum—1 fatal.
1 by rectum and side of anus.
1 by colon—1 fatal.
4 by vagina.
2 by bladder.
1 by iliac region.
3 into peritoneum—3 fatal.
1 by rectum and internal abdominal ring.
1 by vagina, bladder, rectum, and inguinal region.

It will be seen that out of 19 cases 5 proved fatal—3 by emptying into the peritoneum, and 2 by causing colitis and rectitis.

Methods of Operating.—The propriety of opening the abscess having been determined upon, the operator, if he intend reaching it through the vagina or rectum, should carefully investigate, by touch, as to the presence upon their walls of large blood-vessels, the opening of which might prove a source of serious hemorrhage. The patient being placed on the left side and Sims's speculum introduced, if there exist the slightest doubt as to the contents of the sac the needle of a hypodermic syringe should be plunged into it and the point decided. If this be not done, an ordinary exploring needle should be passed into the tissues until pus is seen to flow along its groove. Then the operator, feeling sure of his ability to reach pus, holds the needle in one hand, while with the other he slides the point of a bistoury along its gutter and passes it to the place of accumulation. This is a method at once safe, certain, and effectual, and we should recommend it in preference to any other except that which comes next to be considered. The aspirator affords an easy and effectual means of emptying these accumulations, and at the same time one that is to a great extent free from danger. After it has removed all the fluid which will flow its action may be reversed, the sac filled with warm carbolized water, and this at once drawn off again. Should reaccumulation take place, the situation and certainty of the purulent collection being established, it may be evacuated by a bistoury. If the opening made be large enough to admit the finger, it should be passed in, and by it any tract leading into an adjoining abscess should be enlarged, and any sloughing tissue met removed. After this, should there be any further closure of the canal just opened, its walls may be touched by nitrate of silver or painted with solution of persulphate of iron, or a piece of gum-elastic catheter or rubber tubing may be left in it.

In many cases the pus points toward the abdominal skin, and is as readily evacuated as from any superficial abscess in another part of the body. Only when the pus remains concealed under the firm fasciæ of the lateral abdominal muscles is a careful and patient dissection advisable and necessary.

[My practice in cases of this kind has been for years first to satisfy myself of the presence of pus by inserting an aspirator needle, guided by my finger, the patient lying on her back, into the fluctuating mass at a point where careful bimanual examination has led me to suspect the presence of pus. The vagina of course has been irrigated with a 1 : 5000 solution of bichloride, through which indeed I introduce the needle. Pulsating vessels are carefully avoided. Having struck a cavity, I withdraw the piston, and, finding pus, without removing the needle pass by its side a closed sharp-pointed pair of scissors, with which I pierce the walls of the sac, and, having entered the latter, separate the blades. A gush of pus shows me that my effort has been successful. Keeping the blades separated, I introduce the closed blades of a Palmer's dilator, and screwing them apart remove the scissors, then introduce my finger and gently scrape the walls of the sac. If I find many granulations, I may even use the blunt curette. Now I wash out the abscess-cavity with a 1 : 10,000 bichloride solution, and introduce a soft-rubber drainage-tube suitably perforated, with a cross-piece at the upper end to ensure its retention in the cavity of the abscess. The vagina is then loosely packed with iodoform gauze, the drainage-tube closed by a piece of tape, and the patient removed to bed. The abscess is irrigated several times daily with a tepid 2 per cent. carbolized solution. The gauze is changed when it becomes saturated, and the drainage-tube withdrawn as the abscess closes. Eventually, the abscess may be kept open until entire closure by packing it gently with iodoform gauze every few days.—P. F. M.]

Means for causing Closure of the Sac.—Sometimes, after the evacuation of these abscesses, their sacs will not close, but, remaining open for months and even years, go on pouring out large quantities of pus.

The causes of their not closing are these: the existence of sinuses, which will not allow their complete evacuation; a peculiar condition of their walls from the existence of a membrane, called by Delpech pyogenic, which tends to prolong suppuration; or the passage into the sac of air or feces from the intestines or urine from the bladder.

Of these the first is decidedly the most frequent, and should be met by dilatation of the tract leading to the abscess by tents of laminaria or enlargement by the knife.

Should the abscess have a short and free outlet, the sac should be injected two or three times a week with tincture of iodine, at first in solution, afterward pure; or by solution of carbolic acid.

In case of entrance of feces, air, or urine into the diseased part, a counter-opening should be made which will allow their free escape, and the part kept as clean as possible by injection of tepid water. Then the fecal or urinary fistula allowing the vicarious discharge should be cured by appropriate means.

Before practising any operation for evacuation of pelvic abscesses an anæsthetic should always be administered, as perfect quietude is essential to safety.

[Pelvic abscesses which point toward the abdominal skin, usually in the neighborhood of the iliac fossa, will, as a rule, if they have not been allowed to remain too long unopened, close very readily under the usual treatment of irrigation, packing with iodoform gauze, and, if the granulations are indolent, curetting, and the daily introduction of Peruvian balsam or some other local stimulant; but once in a while the pus has burrowed so deep into the pelvic cavity or the opening made was not sufficiently large or has not been kept thoroughly distended by the daily dressing, and in consequence a sinus has formed which extends deep down into the pelvic cavity and obstinately refuses to close. A sound or probe passed down to the bottom of the sinus may then often be felt through the vaginal wall or may turn off laterally toward the rectum or pelvic wall. Such sinuses are practically incurable unless a counter-opening is made into the vagina and thorough drainage thus established. My practice has been in such cases to push forward the vaginal wall with a stout sound, cut down upon the point of the latter, and, after having made a sufficiently large opening, pass a perforated drainage-tube through from the abdominal incision. Thorough daily irrigation is then employed, and little by little as the sinus contracts the drainage-tube is drawn downward so as to allow the upper portion of the sinus to close. A silver wire or a strand of catgut may be substituted for the upper portion of the drainage-tube, until this finally is discarded in accordance with the healing of the upper portion of the track. In this way gradually the whole sinus may be brought to closure from above downward. It is but fair to say that some of these cases prove among the most rebellious and tedious ones which it falls to our lot to treat in this locality. On three occasions, when drawing the drainage-tube through into the vagina, the slight resistance encountered at the new wound in the vaginal wall sufficed to produce a rupture of the adherent bladder, as evidenced by the escape of urine. The placing of a permanent soft catheter in the bladder, together with frequent or permanent irrigation of bladder and wound, served to close the rent in a few days, and the patients promptly recovered. I would warn operators against making too small cutaneous openings of such abscesses in the hope of sparing the patient a large cicatrix. The more thoroughly the abscess is opened, cleared out, drained, and its cavity incited to fill up from the bottom, the sooner there will be a permanent cure.—P. F. M.]

CHAPTER XXXV.

PELVIC HEMATOCELE.

Definition and Synonyms.—Under this and the synonymous titles of retro-uterine hematocele, peri-uterine hematoma, and bloody tumor of the pelvis has been described an accumulation of blood in the pelvic cavity either above or below the peritoneum.

[The Germans designate an intra-peritoneal effusion as *hematocele*, whether it be loose or incapsulated ; the intra-peritoneal exudation, however, as *hematoma*. I confess that I decidedly favor this method of nomenclature, because it at once shows the location of the effused blood and to a certain extent indicates the proper course of treatment.—P. F. M.]

History.—Although an attempt has been made to prove that the ancients were cognizant of this affection, the proof of such a fact is not satisfactory. The earliest allusion made to it is contained in the works of Ruysch of Amsterdam, who wrote in 1737. After this little attention was paid to it until the time of Récamier, although mention of it was made by Frank, Deneux, and some others.

In 1831, Récamier, under the impression that he was opening an abscess, cut into a tumor behind the uterus and gave exit to a large amount of black, grumous blood, and about ten years afterward Bourdon, one of his pupils, published another case occurring in his practice.

A tabular view of the names of those who have been chiefly instrumental in elucidating the subject and systematizing our knowledge upon it is here presented:

Récamier, 1831, *Lancette française;*
Velpeau, 1843, *Rêcherches sur les Cavitês closes;*
Bernutz, 1848, *Archives de Medêcine;*
Vigues, 1850, *Des Tumeurs sanguines de l'Excav. pelvienne;*
Nélaton, 1851, *Gazette des Hôpitaux;*
Nonat, 1851, *Thèse de Cestan, Gallardo, et Prost;*
Huguier, 1851, Lecture before Surgical Society of Paris;
Gallard, 1855, *Union médicale;*
Voisin, 1858, *De l'Hêmatocèle Rêtro-utêrine.*

We have not endeavored to record the names of all who have made valuable contributions in France, for had we done so the list would have been a long one. Those only are referred to who have been foremost in advancing our knowledge.

It will thus be seen that we are indebted to France for the early literature of pelvic hematocele. Germany has of later years contributed a great deal toward it through the labors of Olshausen, Credé, Braun, Hegar, Virchow, Schroeder, Seiffert, and others; and England through those of Madge, McClintock, and Tuckwell. In America, Prof. Gunning S. Bedford reported the first case which we can find recorded. More recently we were indebted to Dr. Byrne of Brooklyn for a faithful report of several cases. Prior to the year 1851, although it had attracted some attention, it was not well understood even in France, for in 1850 we find Malgaigne cutting into a hematocele under the impression that he was enucleating a fibrous tumor, and losing his patient from hemorrhage.

Frequency.—This subject is not fully settled, a good deal of discrepancy of opinion existing concerning it. Prof. Olshausen of Halle declares that in 1145 gynecological cases he saw 34 hematoceles, and Seiffert of Prague reports 66 seen in 1272 cases of pelvic female diseases. In ten years Dr. Barnes has met with 53 cases, and in twenty years Dr. Tilt has seen but 12.

We do not regard the disease as being by any means very rare, but our experience assures us that many cases of cellulitis and a certain number of uterine and peri-uterine tumors are reported as those of hematocele.

Pathology.—The definition of hematocele has no relation whatever to the cause of the hemorrhage which gives material for the bloody tumor. The disease consists in the collection of a mass of blood in the pelvis either above or below its roof. Whatever be its source, such a collection constitutes the affection which engages us. Ordinarily, we find that the flow giving rise to it takes its origin from one of the three following sources:

1st. Direct escape of blood from vessels in or near the pelvis;

2d. Reflux of blood from the uterus or pubes;

3d. Transudation of blood in consequence of dyscrasia or peritonitis.

It is evident that hematocele is not a disease, but a symptom of a number of pathological conditions. As, however, the source of the hemorrhage which results in the bloody tumor very often cannot be ascertained, we are forced to deal with its most prominent and significant sign, taking this as an exponent of a state which is beyond the possibility of diagnosis.

In works upon practice written twenty years ago we find dropsy treated of as a disease. In those of to-day it is regarded only as a legitimate result of renal, cardiac, or hepatic disease. Obstetric writers even as late as ten years ago described puerperal convulsions as a disease incident to parturition. Those writing ten years hence will probably regard them, as many do to-day, as one of the numerous consequences of renal disease.

The same was said a few years ago with reference to the disease under discussion. At that time the source of the blood in extra- and intra-peritoneal hematocele was often uncertain, not being even revealed by a careful post-mortem examination. At the present day, chiefly in consequence of the frequent performance of abdominal section, it is usually not difficult to detect the precise origin of the hemorrhage, and often even to check it by the ligation of the vessel from which it proceeded.

The special sources of the hemorrhage, as shown by post-mortems in the earlier days and by well-indicated, preconceived laparotomies in recent years, may thus be presented at a glance:

1. *Rupture of blood-vessels in the pelvis.*
    Utero-ovarian;
    Varicose veins of broad ligaments;
    Aneurism of artery;
    Vessels of extra-uterine ovisac.
2. *Rupture of pelvic viscera.*
    Ovaries;
    Fallopian tubes;
    Uterus.
3. *Reflux of blood from the uterus.*
    Reflux of menstrual blood.
4. *Transudation from blood-vessels.*
    Purpura;
    Scorbutus;
    Chlorosis;
    Hemorrhagic peritonitis.

All of these causes have been proved to have resulted in hematocele. but it cannot be questioned that rupture of any blood-vessel which empties its contents into the peritoneum might also do so. Blood poured into the peritoneum from rupture of the spleen, for example, would gravitate toward Douglas's cul-de-sac, because it is the most dependent portion of that membrane, and, coagulating, would give all the signs of a bloody tumor in that locality. At times the affection is indicative of serious internal lesion, rupture of the ovary or tube: at others it results merely from imperviousness of the cervical or tubal canal, which prevents the advance of menstrual blood and causes it to regurgitate into the peritoneum; while in still a third class of cases it is created by the pouring out of blood from the vessels of the peritoneum. The last condition has been described as hemorrhagic peritonitis, and especially pointed out by Virchow. Schroeder believes that peritonitis always precedes the occurrence of hematocele. That it usually accompanies it is unquestionable, but if it be a precursor of this affection, which suddenly bursts forth upon a patient apparently in good health, it tells badly for our means of diagnosis of pelvic peritonitis. It is undeniable, however, that in some cases hematocele does follow and not precede the peritonitis.

Whatever be the source of the blood, it collects either in the most dependent part of the peritoneum or in the pelvic areolar tissue beneath it. Here it remains for a time fluid, then undergoes partial coagulation, becoming a grumous mass like currant jelly, and lastly, all the fluid being absorbed, a hard, resisting tumor composed of fibrinous material remains. Should the collection have occurred in the peritoneum, its boundaries will be the walls of that cavity laterally and below, while a localized peritonitis forms for it a roof of effused lymph. If it collect in the areolar tissue of the pelvis, the effused blood will make its own nidus by percolating the loose structure and mechanically creating a space in it.

In either of these positions it is entirely absorbed and reduced to a hard, firm tumor, which remains for a long time or is discharged by the vagina or rectum or into the peritoneum. The last point of evacuation is fortunately rare. Nonat[1] quotes Dupuytren for the following very ingenious and plausible explanation of the method of such absorption, which he likens to the process of digestion: The vessels of the cyst which are in contact with the mass remove its fluid portion, and thus its hard surface comes in apposition with the sac. This excites effusion of serum, which softens the fibrinous wall and renders it susceptible of absorption, which soon occurs. Then again contact excites a flow of fluid, and again this is removed, until the whole mass is diminished or completely absorbed.

Causes.—A glance at the recognized causes of the disease will make it evident that congestion of the pelvic organs must, in an eminent degree, predispose to it. This explains the fact that it has been found to have occurred most frequently during the period of ovarian activity, and especially during a menstrual epoch.

The predisposing causes are—

The period of ovarian activity, fifteen to forty-five;
Disordered blood-state, plethora or anæmia;
The menstrual epoch;
Chronic uterine or ovarian disease;
The hemorrhagic diathesis.

The exciting causes are—

Sudden checking of menstrual flow;
Blows or falls;

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[1] *Op. cit.*, p. 344.

Excessive or intemperate coition;
Obstruction of cervical canal;
Obstruction of Fallopian tubes;
Violent efforts.

Varieties.—There are two forms of the affection, subperitoneal and peritoneal. In the latter the blood-tumor forms within the peritoneum, where it in time becomes encysted, unless death occur at an early period. In the former it occurs in the areolar tissue of the pelvis, under the peritoneum.

The propriety of the consideration of the former under the same head as the latter has been contested by Aran, Bernutz, and Voisin, but from a clinical standpoint it appears to be quite valid.

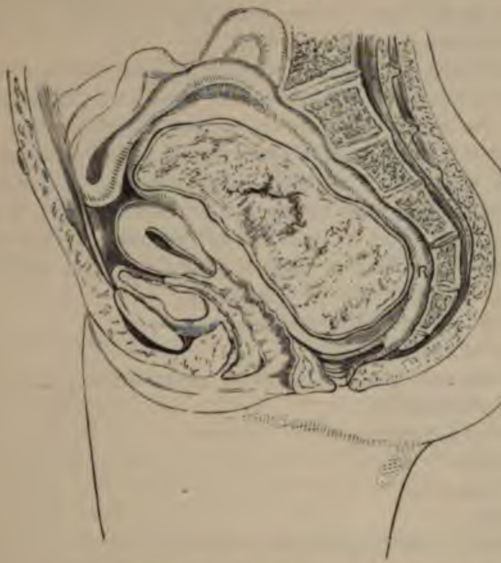
[I confess that, from my own individual experience and considering the entirely different treatment of the two classes of cases, the separation of the intra-peritoneal and extra-peritoneal varieties of hematocele would be most useful. I admit that occasionally it is impossible to make an absolute diagnosis between the two; but where this is possible I would submit that an extra-peritoneal hematocele should always be opened from below, cleared out, and drained through the vagina; whereas in the case of an intra-peritoneal effusion an abdominal section is invariably indicated. The extra-peritoneal hematocele, furthermore, would under such circumstances not be a dangerous affection; whereas the other would partake of all the risks inherent to laparotomy and the removal of the uterine appendages. While I have followed the author's plan of considering these affections under the same heading, in order not to disturb too much the original arrangement of the chapter, I feel that I owe it to myself and my own convictions to state my real standpoint in the matter.—P. F. M.]

Not only have distinct instances of subperitoneal hematocele been recorded by such observers as Simpson, Olshausen, Tuckwell, and Barnes; cases have likewise presented themselves which, commencing as subperitoneal ones, have ruptured the peritoneal covering of the pelvis, and thus broken down the theoretical barrier which pathologists have been inclined to establish between the two varieties.

Of the two varieties the peritoneal is much the more frequent, at the same time that it is the more grave. In 41 autopsies Tuckwell found the tumor to be peritoneal in 38. In a case which I saw with Dr. Emmet we were unable to make a diagnosis of a tumor which lay obliquely anterior to the uterus. [In twenty-four hours the patient fell into a state of collapse, and as we saw her thus the nature of the tumor, which we were doubtful about on the previous day, became evident. Upon a post-mortem examination an ante-uterine hematocele as large as a goose's egg was found under the peritoneum, through which it had broken, discharged a portion of its contents into the peritoneum, and caused collapse and death. This is the only ante-uterine, but not the only subperitoneal, hematocele with which I have met.—T. G. T.]

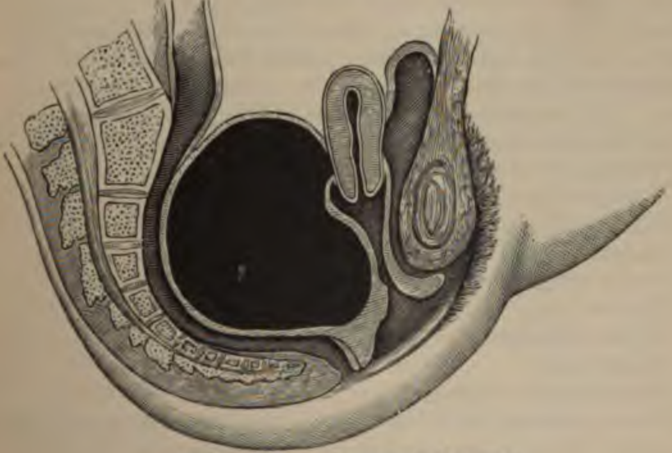
Symptoms.—The absolute occurrence of hemorrhage is generally preceded by symptoms which are premonitory, as fixed, dull pain over the ovaries, derangement of menstruation, metrorrhagia or prolongation of the menstrual discharge. The symptoms of the actual escape

FIG. 239.



Intra-peritoneal Hematocele (Barn

FIG. 240.



Extra-peritoneal Hematocele (Emmet).[1]

blood will depend in great degree upon the nature and gravity of e accident which has given rise to it.

Sometimes the affection occurs without any violent symptoms and most without warning. It will be appreciated that this would be so it were due to gradual reflux of blood on account of constricted cervix, or transudation the result of purpura. Frequently a sudden manifestation of symptoms occurs, and the accident is announced as rapidly as is cerebral apoplexy.

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[1] Both these diagrams might be used to illustrate respectively an intra-peritoneal astic exudation in acute pelvic peritonitis, and an extra-peritoneal effusion of the me material in pelvic cellulitis.

It is evident, then, that the symptoms must differ widely in cases marked by very great and sudden loss of blood and those accompanied by very little. In the first there are evidences of profuse abstraction of vital fluid, great peritoneal shock, and excessive prostration. In the second these may all be so slight as to escape the notice of non-observant patients. The best course which can be pursued in reference to the matter is, we think, to take as an example a case of moderate severity, and guard the reader against supposing that all attacks give the same degree of intensity of symptoms.

Most prominent among the symptoms are—

Severe pain in the pelvis;
Pallor, faintness, and coldness of extremities;
Sense of exhaustion;
Nausea and vomiting;
Metrorrhagia;
Uterine tenesmus;
Tympanites;
Interference with bladder and rectum;
Small and rapid pulse;
Depressed thermometric range.

The patient feels as if a large and heavy body exists in the pelvis, and instinctively strives to expel it by the vagina. At times the pain complained of is very acute; at others it is a dull and heavy aching.

After a variable time, generally within forty-eight hours, a reaction from this state of prostration occurs. Sometimes this is slight, at others decided. It is dependent chiefly upon the degree of inflammation set up by the sanguineous accumulation acting as a foreign body. This is usually marked by the following symptoms:

Tendency to chilliness;
Constipation;
Suppression of urine;
Great tympanites;
Heat of skin;
High thermometric range;
Rapid pulse;
Tenderness over abdomen.

All these symptoms point to three facts: 1st, sudden and excessive loss of blood; 2d, the existence of some substance in the pelvis which mechanically interferes with its viscera; 3d, the presence of a local inflammation causing the high temperature and produced by the sudden irritation of a foreign body, the effused blood. A part of them might be produced by menorrhagia, a part by sudden retroversion, but a union of the whole will strongly excite suspicion of hematocele and call for a physical exploration.

Physical Signs.—Vaginal touch reveals a tumor usually posterior to uterus and vagina, and generally partially closing the latter. The mass thus felt, if the examination be made very soon after its formation, will be found to be soft, smooth, and obscurely fluctuating. If a number of days have elapsed before it be touched, it will give the impression of a smooth, dense, solid body. The uterus will be found pressed out of its position, generally upward and forward, so that the cervix will be above the symphysis. Sometimes, though rarely, it is forced out of the median line to one side.

Nonat[1] dogmatically announces that the uterus is never found between the tumor and the rectum—that is to say, behind the mass of blood; but Chassaignac[2] reports a case in which the sanguineous collection existed entirely between the bladder and uterus, and consequently must have forced that organ backward; and similar cases are recorded by G. Braun, Olshausen, Barnes, Emmet, Thomas, and others.

Rectal touch will show that the bowel is partially closed by pressure from the tumor.

Abdominal palpation will reveal the presence of a hard mass which may extend only up to the superior strait or as high as the navel. In cases where a small quantity of blood has been effused, and more especially where this has collected under and not in the peritoneum, an abdominal tumor may not be discovered.

By the aid of conjoined manipulation the shape, extent, and character of the mass may be further ascertained.

Differentiation.—The diseases with which hematocele may be confounded are—

Pelvic cellulitis or abscess;
Retroversion;
Extra-uterine pregnancy;
Fibrous tumor;
Dislocated ovarian cyst.

The mass created by cellulitis and abscess is usually found at the side of the uterus, and not posterior to that organ; it develops less suddenly than hematocele; is hard at first, and gradually softens; is exquisitely painful to touch; does not lift the uterus and press it forward; and is not usually accompanied by metrorrhagia.

Retroversion may present the signs due to the mechanical results of hematocele, but not those due to loss of blood. If pregnancy coexist, conjoined manipulation will usually suffice for diagnosis. If it should not, the uterine probe will elucidate the case.

Extra-uterine pregnancy does not develop suddenly, but slowly, and is characterized by many of the signs of pregnancy. In place of metrorrhagia there is usually, though not always, amenorrhœa.

Fibrous tumors grow slowly, are painless, and move with the uterus. They are irregular and hard, and do not usually push the uterus so far forward and upward.

Displaced ovarian cysts are painless, show no signs of hemorrhage, and cause no constitutional disturbance or metrorrhagia.

Course, Duration, and Termination.—Hemorrhage from the sources enunciated as those of hematocele may be so great as to destroy life immediately. Five such instances are recorded by Voisin, and Ollivier d'Angers[1] mentions two in which death occurred in half an hour from rupture of a varicose utero-ovarian vein. Such a termination is, however, decidedly exceptional. The tumor generally disappears by absorption, is discharged by the rectum or vagina, or remains a hard, indurated mass long afterward. Discharge is most frequently followed by recovery, but sometimes putrefaction occurs in the walls of the sac, septicæmia takes place, and death ensues. The process of absorption may be accomplished in three weeks, or six months may elapse before it is complete.

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[1] *Op. cit.*, p. 342.

[2] Courty, *Mal. de l'Utérus*, p. 912.

In some cases a slow and steady hemorrhage appears to go on for weeks and render the bloody tumor gradually larger. In others hemorrhages subsequent to the first take place after this has become encapsulated. After subsidence of the symptoms of reaction, chill, fever, and sweating often come on late, marking suppuration in the mass and slight septic absorption.

Prognosis.—The prognosis of hematocele must be governed in great degree by the amount of blood lost, the degree of constitutional shock resulting, and the intensity of reaction excited. As a rule it is favorable—especially so, we should say, when treated upon the expectant plan, and not by immediate surgical interference.

In cases of peritoneal form a graver prognosis is called for than in the subperitoneal, for evident reasons; and where a great deal of blood has been lost the dangers are greater than where the amount has been more limited. This is true not only from the fact that an excessive flow might cause death from exhaustion, but because the removal of so large an amount of coagulum, whether by absorption or discharge, must necessarily expose the patient to great dangers.

When death occurs it is usually a consequence of loss of blood, shock from sudden invasion of the peritoneum, peritonitis, rupture of the encapsulated mass into the peritoneum, or septicæmia.

Treatment.—The physician will rarely be called upon to resort to treatment before the amount of blood which is destined to be lost has collected in the pelvis. He will, however, often be present to witness the great constitutional disturbance and excessive prostration and pain which immediately follow the hemorrhage. The diagnosis being made, the indications for treatment will be simple enough:

1st. To check tendency to further loss;
2d. To prevent death from prostration;
3d. To relieve pain.

[As already referred to, the treatment of the two forms of pelvic hematocele, the intra-peritoneal and the extra-peritoneal, differs most markedly. The presence of a certain amount of blood in the peritoneal cavity means the rupture of a vessel inside of that cavity from which an unlimited supply of the vital fluid may escape, sufficient indeed to produce speedy or immediate death. The rupture of such a blood-vessel should be treated on the same principle as the escape of blood from an artery or vein in any other portion of the body—namely, by an immediate exposure and ligation of the vessel. If, therefore, we have good and sufficient reason to suspect that the rupture of a blood-vessel, be it vein or artery, of sufficient size to be serious, has taken place within the peritoneal cavity, no matter where the bleeding vessel may be situated, in the light of our present experiences it seems our duty to open the abdominal cavity, expose and ligate that vessel, and thus by the only certain means in our power arrest the hemorrhage. The urgency of the adoption of this plan depends mainly on the capacity of the abdominal cavity for holding a quantity of effused blood sufficient to cause the death of the patient.

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[1] Noeggerath, *Bul. N. Y. Acad. Med.*, vol. i. p. 577.

With the pelvic cellular tissue, however, the case is entirely different. Its capacity for holding an effusion of blood is certainly limited, at least for the time being. The meshes of cellular tissue, the natural cohesion of the various organs occupying the pelvic cavity, the difficulty of dissecting up the peritoneum in order to make room for the effused blood,—all these obstacles will naturally prevent the exudation of more than a limited amount of blood during a certain period of time. Hence there does not arise the necessity for immediate action to arrest the hemorrhage, since it to a certain extent tends to control itself. For this reason the directions contained in the following lines are to be carried out, but I wish it understood that in my opinion they apply almost exclusively to cases of extra-peritoneal effusion of blood.—P. F. M.]

These indications should, as far as possible, be met simultaneously, for the dangers to be combated all occur at one and the same moment. The patient should at once, without the delay attendant upon changing the clothing, etc., be put in a condition of perfect rest, and a full dose of morphia be administered hypodermically. A bladder of crushed ice or cloths wrung out of iced water should be laid over the hypogastrium, and bottles of hot water or warm bricks wrapped in flannel should be put to the soles of the feet. Should the stomach not be very irritable, brandy and water or iced champagne should be given freely by the mouth.

If prostration be so alarming as to threaten collapse, and the stomach be intolerant of ingesta, brandy or sulphuric ether in doses, the former of two drachms, and the latter of half a drachm, should be injected subcutaneously by the hypodermic syringe.

Reaction having taken place, the most perfect quietude should be observed, pain should be relieved and nervous shock prevented by the free use of morphine, and the diet should consist of milk, animal broths, and gruels of farina, sago, or Indian meal.

And now will arise the important question whether the accumulated blood should be left for removal by nature or should be evacuated by surgical means. Récamier, in introducing the subject to the profession, inaugurated the practice of evacuating such tumors, and Nélaton endorsed and popularized it. But experience taught Nélaton that the procedure was not judicious, and "to-day he proscribes it in an almost absolute manner." Immediate surgical interference presses its claims in consideration of the facts that—

1st. It is capable of cutting short a lengthy and dangerous disorder;

2d. It may save the patient from the dangers incident to absorption as well as discharge.

3d. It removes from the pelvic cellular tissue a foreign body which, undisturbed, would prove the focus of inflammation.

It is not surprising that it was the favorite plan in the infancy of the subject. When, however, pathologists had had an opportunity of studying the natural history of the affection, it was as naturally abandoned, for the following reasons:

1st. It was discovered that when not interfered with, extra-peritoneal hematocele very generally passes away rapidly.

2d. It was discovered that the dangers of puncture were greater than those of the tumor left undisturbed.

3d. Medical means were found to exert a marked controlling influence over its complications.

With the light which experience has thrown upon this point it appears to us that, without being dogmatic, we may safely adopt this rule: If, as time passes, suppuration within the sac, which has then pretty certainly become encapsulated, and septic absorption are manifested by chills, febrile action, and profuse sweating, the softening mass should be discharged by incision. In other words, so long as the accumulated blood appears to be doing no decided harm and nature seems to be causing its absorption, it should be left alone. But so soon as evidences of septicæmia are observed it should be evacuated. Under these circumstances a neglect of surgical interference would be culpable.

[There are two other reasons why such extra-peritoneal effusion of blood may in rare instances call for evacuation—namely, first, where the amount of effused blood is so large that after a month or more of patient waiting no signs of absorption manifest themselves. There is no evidence of purulent degeneration or of septic infection, but the patient is not improving, the pelvic tumor does not change in size or in consistence, except that it is becoming a little softer perhaps, and naturally all parties concerned are anxious to have the case cured. Second, where a succession of fresh effusions of blood take place, each of course increasing the size of the pelvic tumor and debilitating the patient still more. In the first instance it is useless to wait for nature to effect the absorption of a mass of fluid or coagulated blood amounting to perhaps as much as from two to three pints. By opening the sac thoroughly through the vagina, clearing out its contents carefully, irrigating it, and packing it with iodoform gauze, repeating this latter procedure as often as appears indicated, a speedy shrinking of the sac, its early closure, and rapid recovery of the patient will almost inevitably result. In the second case it is evident that the blood itself does not act as a sufficient hemostatic agent to prevent further hemorrhage, and that firmer pressure is required against the blood-vessels to effect this purpose. We therefore, while perfectly conscious of the risk which we take in opening a cavity portions of which are still liable to bleed, adopt this plan, being fully prepared to check any hemorrhage which may occur after the cavity is evacuated. This is done very readily by packing the cavity tightly with iodoform gauze, which can be safely left *in sitû* for as long as a week even without becoming offensive, and upon removal the bleeding spots will undoubtedly be found to have healed. The treatment of the sac is then as already indicated. I have operated on at least a dozen such cases, evacuated up to two quarts of fluid and coagulated blood, in every instance with perfect and speedy cure.

I am aware that some authors favor the operation of extra-peritoneal hematocele by means of abdominal section, opening the sac covering the effused blood—that is to say, the distended broad ligament—sewing its edges to the abdominal wound, and treating it like an intra-ligamentous non-removable ovarian cyst. I have operated in this manner several times, I confess in consequence of a mistaken diagnosis as to the intra- or extra-peritoneal location of the blood. I have been fortunate enough to cure my cases, but with vastly more labor to myself and danger to them than by the method of vaginal opening. In one case, after opening the abdominal cavity and finding the distended broad ligament so tense as to prevent its attachment to the abdominal wall, I closed the incision and opened the hematoma by the vagina, with the result of a speedy recovery.

In cases where the extra-peritoneal hematoma extends up into the iliac fossa and forms a tumor palpable through the abdominal wall, some operators have preferred to make an incision very similar to that practised in opening a perityphlitic abscess, and have thus entered the cavity containing the effused blood without interfering with the peritoneal cavity. I can see no special advantage for this method of operating over that through the vagina, unless the evacuation of the blood happens to be difficult from below. In one case under my observation, which was operated on by another surgeon after my retirement from the case, it was found necessary, by the surgeon's own statement to me, to open the sac from the vagina in addition to the abdominal incision; which latter, I think, could have been entirely avoided in the case under consideration.—P. F. M.]

Methods of Operating.—The patient being placed upon the back, as if for lithotomy, a trocar and canula may be held in the right hand, guided to the most fluctuating and dependent part of the mass, and plunged in. Or, the patient lying on the left side, the perineum and posterior vaginal wall may be lifted by Sims's speculum, and an incision made into the wall of the tumor by a tenotomy knife or small bistoury. Through the opening thus made one or two fingers should be introduced and the clots removed. After evacuation by either method the nozzle of a syringe should be introduced into the sac, and a stream of tepid water, with or without a very small amount of carbolic acid, should be very gently and cautiously made to wash out the cavity remaining. This should be repeated once or twice in twenty-four hours for prevention of septicæmia. All this should, as far as possible, be done under the antiseptic method.

After the abatement of acute symptoms a blister, four by six inches, should, unless some contraindication exists, be applied over the hypogastrium, and this may with advantage be repeated every ten or twelve days. Its results will often be very marked, and, although apparently harsh practice, it prevents much suffering, while it causes but little.

As time passes and pain is relieved, quinine, alone or combined with sulphuric acid, in full doses will prove a valuable remedy, and should be kept up perseveringly.

CHAPTER XXXVI.

MYO-FIBROMATA, OR FIBROID TUMORS OF THE UTERUS.

Definition and Synonyms.—The parenchyma of the uterus is liable to undergo a localized hypertrophy, which results in the production of two varieties of tumors—the fibrous and the fibro-cystic. The first, which is one of the most frequent pathological conditions to which this organ is subject, will now receive attention, while the second and much rarer form will be treated of in a separate section.

By the older writers fibrous tumors were styled tubercula, steatomata, sarcomata, etc. Since their true nature has been more carefully studied by aid of the microscope and been understood, they have been described under the name of fibrous tumors, uterine fibroids, fibroma, and more recently, by Virchow, myoma. We have adopted the terms which head this chapter, following the example of Billroth for the first, and of Klob for the second, for the reason that neither that of fibroma nor myoma alone expresses the existing pathological condition. Billroth[1] rejects the latter name, which signifies that these growths consist in hypertrophy of muscular substance, and at the same time he refuses to admit the former, as that conveys the equally incorrect idea that they are constructed of connective tissue. Fibroid (*fibrosus* and ειδος), resembling fibrous tissue, is at least not calculated to mislead, while myo-fibroma expresses the exact truth.

History.—Until the time of Dr. William Hunter, who wrote toward the close of the eighteenth century, the true nature of uterine fibroids was not appreciated. They were confounded with malignant growths, of which they were regarded as a variety. He described them under the name of fleshy tubercle, and contributed greatly to the knowledge of their pathology; but it was not until the writings of Chambon,[2] Baillie, Bayle, and others that the subject was fully elucidated. Sir Charles Clark in 1814 wrote an excellent chapter upon them, which would almost answer the requirements of our day.

Pathology.—Surprise that any confusion should have existed between these tumors and cancerous growths will cease when we consider that their identity is boldly assumed by so careful an observer as Dr. Ashwell as late as 1844. He gives five reasons for his belief which he declares appear to him "conclusive." His reasoning has failed to convince others, no writer since his time having adopted the view which Dr. Hunter succeeded in abolishing, and no fact in gynecology is now more fully settled than that of the non-malignancy of these tumors.

We mention the above belief merely as a matter of ancient history. Since our own personal earliest recollection there has been at no time a question as to the benignancy of fibroid tumors. That they may occasionally, although very rarely, gradually change their composition and become malignant can, unfortunately, not be denied.

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[1] *Surg. Pathol.*, p. 583.

[2] *Mal. de l'Utérus.*

Bayle and Lobstein have declared that they never undergo cancerous degeneration, and the researches of Cruveilhier and Lebert tend to support the view; while Kiwisch, Dupuytren, Atlee,[1] and Simpson believe that malignant degeneration occurs in rare cases. The weighty authority of Virchow[2] is cast into the scale favoring the possibility of both carcinomatous and sarcomatous degeneration, and Klob agrees in this assertion. "In 1862," says the latter author, "a singular specimen was added to the Salzburg Museum. From a fibroid tumor the size of a child's head, situated in the posterior walls of the uterus, carcinoma had undoubtedly been developed without any other portion of the body being affected; and I am therefore constrained to allow the possibility of such a transition, although I cannot recall a second case of this kind either in the literature of the subject or in my rather extensive experience."

Although this case seems to settle the matter of possibility at least, it must not be forgotten that beyond doubt such a change of type is exceedingly rare. It is in this connection a fact worthy of note that in the negress, in whom fibroid tumors are so common as to be regarded by some as almost universally met with after the thirtieth year, carcinomatous affections of the uterus are very rarely seen.

[Within the past year I have met with a case of a large subperitoneal fibroid in which the diagnosis was absolutely assured, and, there being no constitutional symptoms whatever, where I practised vaginal galvano-puncture six times with a negative result. Nine months after she had left my private hospital for her home in the West I received a letter from her husband, a physician, informing me that she had died of malignant sarcoma, the diagnosis being made by one of our most eminent specialists in a neighboring city. Curiously, she had become pregnant in spite of the tumors, and died a week after the induction of premature labor from the exhaustion attending the malignant growth. I have no question that the malignant degeneration set in long after she left my care. Whether the electro-puncture had anything to do with this I must leave a matter of doubt.—P. F. M.]

[I have met with two cases in which uterine fibroids which had been known to exist for eight and ten years, and had behaved like benign growths, suddenly took upon themselves the aspect of sarcoma and led to a fatal termination. In one case the tumor was removed post-mortem, and in the other ante-mortem with great relief to symptoms.—T. G. T.]

Uterine fibroids may develop singly, when ordinarily they do not attain to a very great size. Sometimes, however, they exist in great numbers and grow to a very large size. Courty reports one weighing fifty pounds [and I have removed one, with uterus and both ovaries, of the same weight. Some years ago I exhibited to the New York Pathological Society the uterus of a negress which contained thirty-five tumors of every size between that of a fœtal head and that of a marble.—T. G. T.]

Fibroids may develop in any part of the uterus, but the usual site is in the body or fundus. Mr. S. Lee examined seventy-four preparations in the London museums, and found that the rarest of all locations for them is the cervix. A very interesting instance of a large tumor developed below the os internum is reported by Dr. Murray in the sixth volume of the *London Obstetrical Transactions*. [I have myself removed several of this character from the parenchyma of the cervix, the body of the uterus being in no wise involved.—T. G. T.]

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[1] McClintock, *Diseases of Women.*

[2] *Pathologie des Tumeurs*, Paris, 1871.

[The largest cervical myoma which I had occasion to remove was one weighing three pounds, and situated in the anterior wall of the uterus and lip of the cervix, which filled the pelvic cavity so completely as to render the delivery of the woman, who was six months pregnant when she came under my care, absolutely impossible. I removed the tumor by enucleation *per vaginam*, and then delivered the woman. She made an easy recovery.[1] Two years later I removed another cervical myoma from the same woman, which had developed and grown down since the previous operation.—P. F. M.]

The structure of fibroid tumors varies very greatly, not only from their original development being different, but from their being susceptible of several diseased states, which will very soon be mentioned, and which produce their characteristic alterations. The typical form is that of hard, resisting fibrous tissue, which creaks under the knife. Under the microscope this is found to consist of long, fine fibres generally united in bundles, of fusiform fibre-cells analogous to fibro-plastic elements, and of round or elliptic granules of small size, the whole being bound together by fine intercellular substance.

They consist of the hypertrophied elements of the uterus, to which organ they are strictly homologous. In the majority of cases it is declared by recent pathological investigators that connective tissue preponderates in their construction, but there is always a certain degree of muscular hypertrophy concerned in their development; hence Billroth's objection to the terms "fibroma" and "myoma." In some cases the amount of muscular exceeds that of connective tissue in their construction. This, which may be styled the normal type of the uterine fibroid, is departed from by formation of cysts in the midst of the fibrous tissue, which constitutes the tumor one of fibro-cystic character.

Uterine fibroids are liable to a variety of diseases, among which the most frequent are œdema, inflammation, gangrene, cystic, fatty, and calcareous degeneration, and apoplexy. The last consists in rupture of small blood-vessels within the mass, and consequent accumulation of blood.

Very rarely the whole mass becomes a ball of calcareous matter, which, projecting *in utero* and becoming detached, is sometimes discharged *per vaginam*. This is the disease which was described by old writers as uterine calculus. The uterine attachment of fibroids of compound character is sometimes the seat of a species of varicose degeneration of the small vessels, which causes the structure to resemble erectile tissue. Tumors thus affected have been styled by Virchow telangiectatic tumors. This vascular structure readily bleeds, and in

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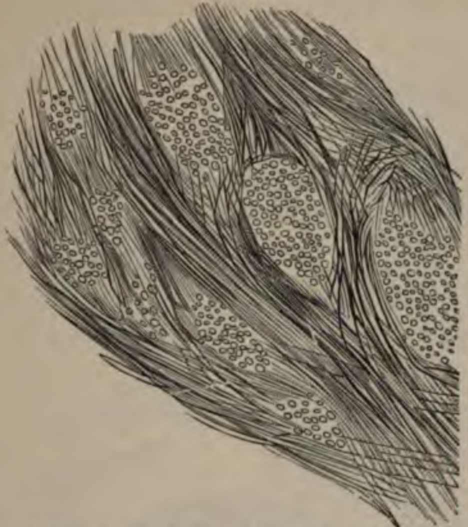
[1] *Amer. Gynecol. Trans.*, 1884.

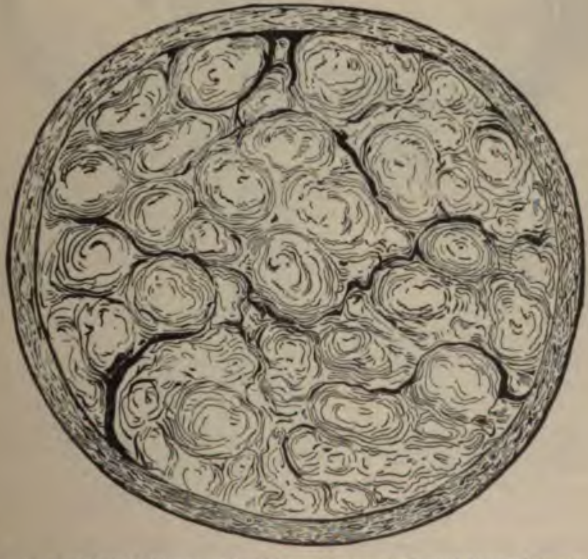
FIG. 241.



Uterine Fibroma: Oblique Longitudinal Section of Muscular Cell-bundles (Billroth).

ne case we saw it the cause of a small hematocele. But large vessels re likewise discovered in the pedicles of fibroids, Caillard reporting

FIG. 242.

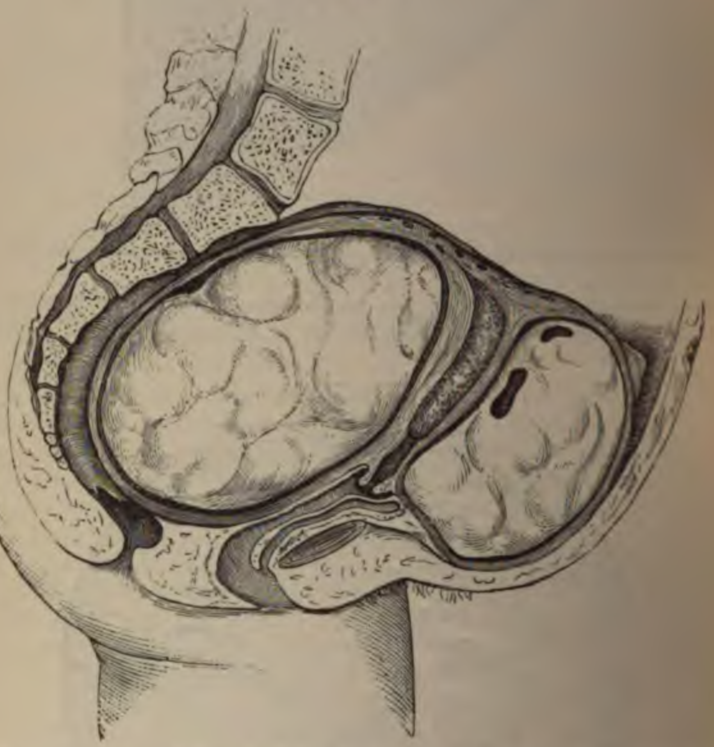


Section of a Large Fibroid Tumor, with Fibres arranged around Several Centres (Sutton).

ne the size of the radial artery. Klob has met with but one such essel, which was the size of the uterine artery.

Varieties.—Klob divides these growths into two classes—simple and compound. The first consists of one tumor, which is generally spherical, and which is connected by loose connective tissue with the uterus. The second is a compound tumor, made up of a number of small fibroids connected by loose connective tissue. The second variety is more vascular than the first, and its surface is nodulated and not smooth. Both these classes present themselves clinically in three varieties, which are created by the locality of the growths in the walls of the uterus. If they lie under the mucous membrane projecting into the uterine cavity, they are called submucous; if under the peritoneum, subserous; if in the wall of the uterus, interstitial.

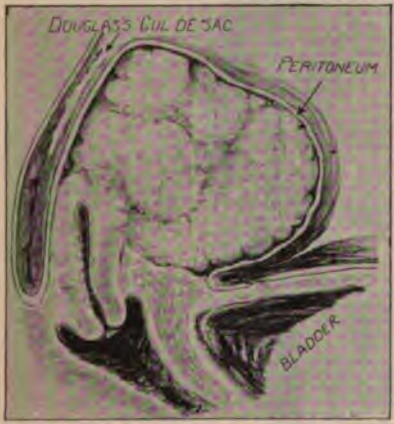
FIG. 243.



Large Subperitoneal Fibroid Tumors, one in the Anterior and the other in the Posterior Wall of the Uterus.

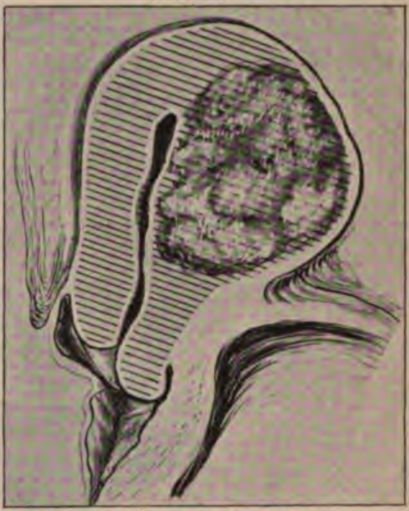
If a tumor be situated in the wall of the uterus, it may remain there until it assumes large dimensions. Should it be near the mucous or serous lining, it is subjected to contractile efforts on the part of the surrounding parenchyma which are excited by its presence, and which often in time force it toward the uterine or abdominal cavity. Sometimes its connection with the mother-tissue is kept up by a broad base; sometimes it is limited to a long, slender pedicle, which in the case of the subperitoneal varieties allows of great mobility. Should the mass be forced into the uterine cavity, and gradually assume a slender, pedunculated attachment, it receives the name of fibrous polypus, which is therefore a variety of submucous fibroid.

FIG. 244.



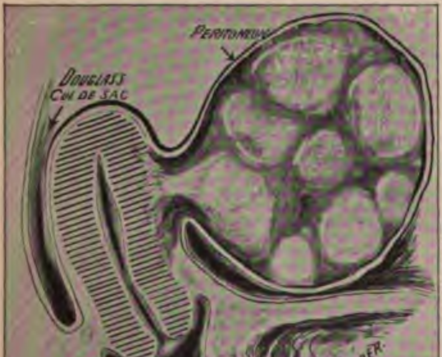
Subperitoneal Fibroid.

FIG. 245.



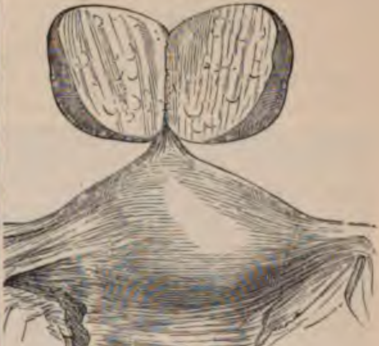
Interstitial Fibroid.

FIG. 246.



Pediculated Subperitoneal Fibroid.

FIG. 247.

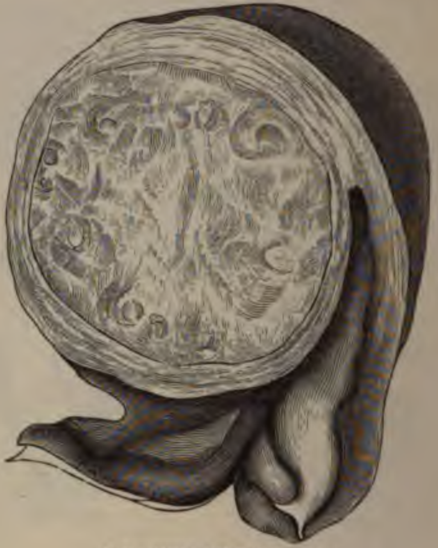


Pediculated Subperitoneal Fibroid.

These neoplasms often affect the uterus very curiously. The interstitial varieties produce every form of displacement; the submucous sometimes produce complete inversion of uterus and vagina; and the subperitoneal, Virchow declares, by dragging the fundus upward not

only draw out the cervix so as to make it resemble the urethra, b
absolutely cause "the spontaneous separation of the neck from t

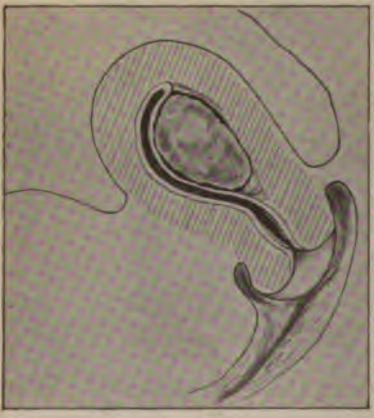
FIG. 248.



Interstitial Fibroid Tumor.

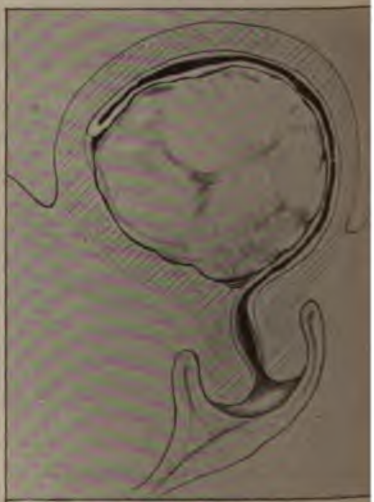
body of the uterus." The last variety, too, sometimes shows mo
singular migrations. The pedicle being broken, they have at tim

FIG. 249.



Small Submucous Fibroid with Broad Sessile Attachment.

FIG. 250.

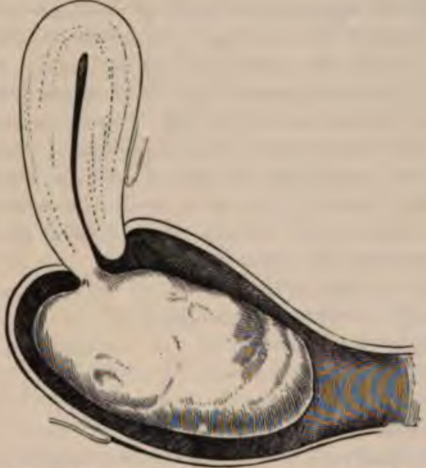


Large Submucous Fibroid with Broad Ses Attachment.

(Suitable for removal by enucleation and traction, or by *morcellement*, after dilatation of th cervical canal.)

been found rolling about freely in the peritoneum, and at others, having set up adhesive inflammation, they have been found detached from the uterus and attached to some other abdominal viscus.

FIG. 251.



Fibroid attached to Posterior Lip of Cervix (simulating a polypus).

Causes.—The predisposing causes, or rather those generally regarded as such, are—

Race, the African being peculiarly liable;
Age, from thirty to forty-five;
Nulliparity;
Menstrual disorders of long standing.

Concerning the exciting causes, one writing in the year 1891 may, unfortunately, quote the words of Sir Charles Clark, recorded in 1814: "Nothing is known respecting the cause of this disease." Nearly eighty years of research have thrown no light upon its etiology.

Complications.—The most frequent of the complications which show themselves in the course of the disease are—

Endometritis;
Displacements;
Cystitis;
Obstruction of the rectum;
Hemorrhoids;
Pelvic peritonitis;
Areolar hyperplasia;
Atrophy of uterine walls;
Grave menstrual disorders.

Every one who has made autopsies upon cases in which uterine fibroids have existed must have been struck by the fact of the varied appearance of the walls of the uterus. Where several tumors exist the uterine cavity is sometimes so perverted and rendered so tortuous that it cannot be traced, while in cases where a large number of tumors are formed the whole uterus seems to have disappeared, its place being usurped by tumors. [In the case already cited, in which I counted thirty-five tumors, no trace of the uterus could be discovered by the naked eye above the os internum.—T. G. T.] In some cases the vice of nutrition set up by the presence of these growths results in thickening of the uterine walls by the establishment of interstitial hypertrophy, in others localized points of thickening exist, while in others still the wall of the uterus may become so attenuated by distension and atrophy as to leave only a thin film to represent it. This distended and attenuated organ is that which Walter has styled the "membranous uterus."

Symptoms.—The enumeration of complications just given is a sufficient explanation of the great number of rational signs which present themselves, for not only do we meet with the symptoms of fibroid tumors, but with those of a variety of disorders which they excite. Most prominent among the symptoms are—

Menorrhagia or metrorrhagia;
Irritability of bladder and rectum;
Pain throughout the pelvis;
Uterine tenesmus;
Profuse leucorrhœa;
Dysmenorrhœa;
Signs of pressure on crural nerves and vessels;
Watery discharge from uterus.

These symptoms are not equally common to the three varieties of the affection. Subperitoneal tumors often, and interstitial tumors sometimes, are accompanied by none, or at least by very few, of them. It is the submucous variety which most constantly and prominently develops them.

The immediate effects of uterine fibroids are exerted upon the system through the following means:

1st. They produce excessive menstrual discharge and profuse leucorrhœa, which impoverish the blood;

2d. They press upon and derange the innervation of neighboring parts;

3d. They in some way interfere with hematosis and the functions of the ganglionic nervous system;

4th. They disorder the mind by creation of depression of spirits, from the fact that the patient recurs with gloomy apprehension to their existence almost constantly.

Physical Signs.—Although the rational signs are so numerous and striking, they can never do more than excite a suspicion, which leads to investigation by physical means.

In the case of a large tumor no difficulty in diagnosis will present itself; for the results of vaginal touch, abdominal palpation, and conjoined manipulation will be so decided as to settle the character of the case definitively. When, however, a growth of small size exists, great difficulties will often attend diagnosis, which may be delayed until the case has been under observation for a long time. A thorough examination involves full and careful exploration by touch of the anterior and posterior surfaces of the uterus, as well as of its cavity to the fundus.

To examine the external surfaces of the uterus the patient should lie upon the back with the thighs flexed. All constriction should be removed from the waist and the bladder and rectum emptied. The examiner then, depressing the uterus by the right hand placed over the hypogastrium, should sweep the index finger of the other as high up as possible over the posterior wall, first by vaginal and then by rectal touch. While the finger in the vagina or rectum lifts the uterus, the tips of the fingers placed on the abdomen should be forced behind the fundus and downward over the posterior uterine wall, so as to approach the finger within the pelvis. By these means the posterior wall will be superficially examined in women with tense abdominal muscles, thoroughly in those in whom they are thin and relaxed.

The finger in the vagina now drawing the cervix forward, the fingers of the hand on the abdomen should be made to depress its walls so as to sweep from the fundus over the anterior surface down to the cervix. The finger under the cervix, lifting it up, will offer itself as an opposing force to the hand on the abdomen. This manœuvre will fully expose to examination the anterior surface of the uterus unless the patient be very fat. Should she be so, a tenaculum may be fastened in the cervix and the uterus drawn down by it, so that the posterior wall will be better within reach of rectal touch, and the anterior wall within that of vaginal exploration when the finger is pressed firmly against the base of the bladder.

For investigating the interior surface of the uterus the neck should be fully dilated by tents, and immediately upon their removal, the uterus being depressed as for examination of the outer surface, the finger should be carried into the cavity of the body.

Differentiation.—The diseases which may be confounded with fibrous tumors are—

Pregnancy;
Para-uterine cellulitis;
Pelvic hematocele;
Anteflexion or retroflexion;
Ovarian tumors;
Fecal impaction.

In pregnancy, amenorrhœa and other signs of utero-gestation exist, while in uterine fibroids there is usually a tendency to menorrhagia. In pregnancy the uterus is symmetrical, in fibroids usually asymmetrical. The tumor found in pregnancy is generally softer than in fibroids, and more uniformly median in position. In a doubtful case time, with its development of fœtal movements, will always settle the point. It should not be forgotten that pregnancy and fibroids may occur together, the recognition of the tumor being rendered more difficult by the softening always produced in such growths by pregnancy. A point in aid of a correct diagnosis is the increased size of the uterus, out of proportion to the supposed time of gestation, as well as its irregular shape.

The tumor created by cellulitis is immovable, very sensitive, accompanied by fever, comes on suddenly, and fixes the uterus. A fibroid tumor is the opposite of this in every respect.

Hematocele generally occurs suddenly and with violent symptoms. The tumor is sensitive and immovable, at first semifluid, and accompanied by tympanites and constitutional disturbance. Fibroid tumors show no such symptoms.

Flexion may be determined by the uterine probe, and differentiation established between it and fibroids by conjoined manipulation and rectal touch.

Ovarian tumors of solid form are the only ones which usually give difficulty in diagnosis, and these are rare. They are accompanied by menorrhagia, can be pushed from side to side without affecting the position of the uterus as ascertained by vaginal touch, and are less affected by movement of the uterus by means of the uterine sound. In cases where an ovarian tumor is firmly attached to the uterus differentiation is not only difficult, but often impossible.

Fecal impaction presents a tumor which can often be indented by pressure, is generally in the caput coli, does not move with the uterus, gives severe intestinal pain and disorder, and exerts little influence on the functions of the uterus.

From this rapid disposal of the subject of differentiation it must not be supposed that it is always an easy matter. In many cases only careful watching will enable the diagnostician to arrive at a certain conclusion.

Prognosis.—The practitioner cannot be too cautious or display too much reticence in pronouncing the prognosis of uterine fibroids. There are few diseases in which the young physician will be led into greater error or be made to regret more decidedly an over-confident prediction. Fibroid tumors, unless of great size, rarely end fatally, however gloomy the prospect may appear when they are first discovered. And yet death from them is not so infrequent as to warrant an entirely favorable prognosis.

Frequency.—These statements are to a certain degree corroborated by an examination into their frequency. Were they as dangerous as is sometimes supposed, a large number of deaths would be annually produced by them, for, to use the words of McClintock, "without question the most frequent organic disease of the uterus, if we except inflammation and its effects, is fibrous tumor." Bayle estimated that of all women dying beyond thirty-five years of age, 20 per cent. were thus affected. Even supposing that this assumption was an exaggerated one, an idea of the frequency of the affection may be gathered from the fact of his venturing upon it, and surprise at it will be modified when the following extract is read from Klob.[1] In speaking of their frequency he says: "At the climacteric period it is such that undoubtedly 40 per cent. of the uteri of females who die after the fiftieth year contain fibroid tumors."

Let the diagnostician who has discovered a uterine fibroid, and feels prompted to give a grave prognosis concerning it, bear these facts in mind, and he may be prevented from injuring his patient's comfort and his own reputation by so doing.

Course, Duration, and Termination.—As already stated, these growths may attain the enormous weight of fifty pounds. Fortunately, they very rarely reach such dimensions, but even when they do not they sometimes exhaust the patient by metrorrhagia, leucorrhœa, hydrorrhœa, and a low grade of constitutional irritation, often attended by hectic fever. But this termination, like the preceding, is exceptional. Having attained a moderate size, they generally remain stationary or increase slowly until the menopause, creating considerable inconvenience and depreciating the patient's strength by hemorrhage. Then, undergoing a certain degree of atrophy with the cessation of uterine and ovarian functions, they cease to be to any degree a source of annoyance or at least of danger. Even during the age of uterine activity nature may, unaided, effect a cure by the following means:

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[1] *Op. cit.*, p. 177.

Absorption or atrophy;
Direct expulsion by rupture of attachment;
Sloughing from deprivation of nutrition, or inflammation;
Calcareous degeneration;
Gangrene.

The tumor is sometimes deprived of nutrition by inflammatory action occurring in the vascular structure of the uterine attachment, which has already been described, collections of pus being sometimes discovered in it.

Throughout their existence these tumors sympathize in the uterine changes which attend upon these three conditions: menstruation, utero-gestation, and the menopause. With the occurrence of menstruation they, like the tissue of the uterus, become congested, enlarged, and sensitive. During pregnancy their component muscular fibres grow, and probably undergo retrograde metamorphosis after delivery. As senile atrophy succeeds the menopause their nutrition is impaired, and fatty and calcareous degeneration sometimes occurs.

Sometimes fluid collections take place within these masses, some morbid process destroying their tissue as if by liquefaction. The fluid thus collecting may be purulent, watery, or sanguineous. In some cases a colloid degeneration is said by pathologists to occur in or near the centre of the mass, which softens down and liquefies the fibroid tissue. In others an apoplexy takes place which creates the initial cavity, and this is subsequently found filled with the débris of the clot and with turbid serum.

Palliative Treatment.—In the vast majority of cases of interstitial and subserous fibroids the efforts of the practitioner should be limited to palliation of the evils resulting from these growths. These evils will generally be due to either one or all of the three following conditions which result from them: displacement of the uterus, pressure on surrounding organs and parts, and menorrhagia or metrorrhagia. The first will often be greatly relieved by restitution of the displaced organ, and its retention at, or even above, the superior strait. This may be accomplished by the ordinary means of replacement and the use of the bulb pessary (Fig. 221) in difficult cases, or of one of the varieties of intravaginal anteversion or retroversion pessaries in less obstinate ones. By a properly-adjusted pessary, aided by complete removal of weight and constriction from the abdomen and the use of an efficient abdominal pad, the second set of evils may be ameliorated. Relief of hemorrhage generally proves difficult, and not rarely impossible. The presence of the fibroid *in utero* keeps up congestion of the endometrium, and this results in leucorrhœa, hydrorrhœa, and menorrhagia. Fortunately, good can generally be, to a limited extent at least, effected by rest in the recumbent posture during the menstrual periods; the use of hemostatic agents, as elixir of vitriol, ergot, viscum album, hydrastis canadensis, cannabis Indica, gallic acid, etc., and the use of the tampon after the loss of blood has reached an amount equal to that lost during normal menstruation. The practice of applying a tampon of carbolized cotton impregnated with solution of alum after a menorrhagic flow has, under these circumstances, lasted for four or five days, we often resort to, and never with any but good results. Without some such controlling influence the patient will commonly become greatly exsanguinated. While these means are being adopted the bowels should be kept regular and the functions of the skin and liver carefully supervised.

In some cases the engorged condition of the mucous membrane lining the uterus causes it to become covered by little fungoid growths, which keep up and greatly increase the amount of hemorrhage. Under these circumstances the application of the wire curette is of great service. Even if there should be an error in diagnosis, this treatment will accomplish good by severing the distended vessels of the mucous membrane and relieving congestion.

Should it be found that by this means even hemorrhage is not sufficiently controlled, resort should be promptly had to palliative resources of a more decidedly surgical character. These may prove efficient as hemostatics, while at the same time they prepare the way for curative means if they should be in time deemed necessary.

It has been found that hemorrhage due to uterine fibroids is often greatly diminished by section of the uterine neck, a practice which was first inaugurated by Amussat, and imitated by Nélaton, Brown, and McClintock. In some not very explicable manner cutting through the cervical canal by deep incisions on its sides exerts a good influence in controlling this form of hemorrhage. A still more powerful effect will follow incision directly through the investing coat of the tumor itself, so as to cut its capsule, its superficial layer of fibres, and its superficial blood-vessels, and thus diminish its vascular supply. When, however, the tumor becomes so accessible as to render this possible, complete removal becomes so likewise, and should be preferred.

Curative Medicinal Means.—Whether absorption of these neoplasms can be excited by any of those medicines styled absorbents is not certainly ascertained. Tumors have in some instances been known to disappear while such drugs have been employed, and perhaps they did so in consequence of their use. But no such effect can be looked for with any confidence. Indeed, with our present experience such a result must be regarded as decidedly exceptional. Scanzoni, after advising those medicines which are most popular as stimulants of absorption, says: "We do not remember a single case in which, with the means indicated or with others, we have obtained the complete cure of a fibrous body." If such drugs be tried for this purpose, they should be continued for many months, and even a year or two, before the trial can be considered fairly made, for their action is never immediate. Those in greatest esteem are iodine, the iodide and bromide of potassium; that class of drugs supposed to possess the power of inducing fatty degeneration, as arsenic, phosphorus, and lead—"steatogenic" drugs, as they have been styled; preparations of lime; and the waters of certain mineral springs, as Kreuznach, Kissingen, Krankenheil, etc. Some of these waters may be employed externally in the form of baths as well as internally.

The late Prof. Hildebrandt of Königsberg some twenty years ago published very elaborate reports of a number of cases of fibroids of different varieties which he had benefited, and in part cured, by the injection of a solution of ergot under the skin. In some of his cases the result was simply marvellous, even large tumors entirely disappearing after a comparatively limited number of injections, and where the tumor did not disappear its diminution was marked, the hemorrhages ceased, and the pains were relieved. His statements attracted widespread attention, and his method was tested by many practitioners all over the world. To a certain extent it was found that the assertions of its inventor—namely, that the growth of uterine fibroids was arrested by the contraction of the enclosing muscular fibres of the organ and the interference with the blood-supply thereby produced—were true, and for a time many experiments were made with this procedure; but there were certain disadvantages attending it which generally led to its abandonment, so that at the present day very little is heard of it. The chief of these objections were the pain and suppuration very commonly produced by the hypodermatic injections; further, the danger of causing gangrene and sloughing of the tumor in consequence of the diminished blood-supply produced by the uterine contractions; and finally, the increased employment and success of the removal of these tumors by laparotomy or their control by the local application of the galvanic current. Although, as we have stated, the systematic employment of this method for the cure of uterine fibroids has practically been discontinued, we would still advise the employment of deep hypodermatic injections of one-half to one syringeful of Squibb's fluid extract of ergot into the abdominal wall near the umbilicus whenever dangerous uterine hemorrhage demands immediate interference. This might be the case either with uterine fibroids, or perhaps more frequently in post-partum hemorrhage.

To Drs. Cutter of Boston and Kimball of Lowell probably belongs the credit of having first carried out systematically the treatment of uterine fibroids by electro-puncture. In 1880, Dr. Cutter reported 50 cases treated in this manner, 4 of which were cured, 32 improved, 4 ended fatally, and the rest were not benefited. Their method consisted in plunging large, gutter-shaped electrodes through the abdominal walls into the tumor on each side of the median line, and connecting them with the two poles of the battery. It is apparent that, in spite of the comparatively slight mortality following this heroic treatment in the hands of its authors, the method on its face was too dangerous to excite approval or imitation. So far as we know, it has now fallen entirely into disrepute. In place of it, however, has come the abdomino-intra-uterine application of the galvanic current, known as the Apostoli method, which has attracted more attention during the last five years than perhaps any other single subject in gynecology. For our estimate of it, and the details of its employment so far as the limit of this work goes, we refer the reader to the chapter on the Use of Electricity in Gynecology. We will merely say here that we consider its utility unquestionable in a certain number of cases; that we believe that in some instances the tumor may be entirely dispersed, in others diminished in size, and in others, again, the symptoms totally relieved; but that complete and permanent cure can be expected, so far as our present experience goes, only in a comparatively small number of cases. Galvano-puncture *per vaginam* in suitable cases, with the other pole on the abdomen, is in our opinion more effectual, while, however, more risky.

Before taking up the consideration of the surgical resources applicable to uterine fibroids, we would sum up the general management of their varieties in the following manner:

1st. With the means at present at our command all the varieties of fibroids, the subserous, the submucous, and the interstitial, are amenable to extirpation; but the danger of removing the first by laparotomy is so great that this should not be resorted to unless life be threatened by the non-removal of the tumor.

2d. If an interstitial fibroid be readily accessible by cutting through its investing tissues, it should be removed.

3d. Submucous fibroids divide themselves into two classes, thus: if the os internum be obliterated and the tumor present at or within the os externum, the case is most favorable for removal; if the os internum be unyielding and the cervical canal undilated, danger will always attend dilatation preliminary to removal of the growth.

4th. In cases unfavorable for removal it is best to resort to good diet, tonics, ergot, and means calculated to palliate symptoms, and await an alteration in existing circumstances, which may prove more favorable to a resort to radical treatment.

Curative Surgical Procedures.—The gynecologist of to-day in recognizing the important advances in his department, signalized by the discovery of ovariotomy, the cure of vesico-vaginal fistula, and reparative operations upon the perineum, the uterus, and the vaginal walls, often forgets how much has been done in reference to the extirpation of uterine fibroids of all three varieties. Prior to the present century, and even during the first half of it, the operation of laparotomy for subperitoneal tumors of this class was unknown, interstitial tumors were uninterfered with, and he who studies the methods of those who attacked submucous growths by the constricting ligature will at once appreciate how hazardous, difficult, and uncertain were the means at the disposal of the surgeon of the olden time for dealing with them.

The keynote to the modern advance in this subject was struck by Heath and Charles Clay in 1846; by Burnham of Lowell, who performed the first successful operation by laparotomy in 1853; and by Dr. W. L. Atlee of Philadelphia, when in the year 1853 he presented to the American Medical Association an essay entitled "The Surgical Treatment of Certain Fibrous Tumors of the Uterus heretofore considered beyond the Resources of Art." This essay received the prize of the association, and to-day stands as the pioneer article in the surgical literature of these grave and otherwise irremediable cases.

Both in this country and in Europe the lead of this bold surgeon has been followed, and the methods which he advocated a quarter of a century ago, and which slowly battled with a pretty decided opposition, have come to be recognized as legitimate surgical resources.

The views of Atlee, as published in 1853, may be epitomized in these three propositions:

First—If a non-pediculated tumor cannot, from the nature of its attachment and envelopes, be expelled or drawn by mechanical means through a dilated os uteri, it is advisable to make by the knife a means of escape for it into the uterine cavity through its capsule or enveloping tissues.

Second—If the tumor thus offered an outlet cannot be removed, it should be forced into and out of the uterine cavity by cutting the cervix and persistently using ergot.

Third—The tumor once coming within reach, it should as soon as practicable be enucleated or detached and removed by the surgeon.

Of course, each one of these methods should be carefully considered before subjecting the patient to the dangers which undoubtedly attend surgical interference of so serious a nature. Septicæmia, peritonitis, hemorrhage, and exhaustion may follow the successful, and still more the unsuccessful, attempt to remove these growths. It should be borne in mind that, as a rule, an operation of this kind once begun ought to be concluded, in order to avoid as much as possible the above dangers, and above all is stress to be laid on the fact that before attempting to remove a deep-seated, non-pediculated uterine tumor through the cervical canal the external and internal orifices of the uterus should be at least as widely dilated as the transverse diameter of the tumor. We know of no more difficult or dangerous operation than to attempt to extract a sessile fibrous tumor which is larger than the cervical canal through which it is to be drawn. Dilatation of the cervical canal, therefore, by successive sets of tupelo tents, discission of the intravaginal portion of the cervix, and even of the circular fibres of the internal os, should therefore accomplish what, fortunately in many cases, the expulsive efforts of the uterus have already performed. Once let the intra-uterine tumor present through the dilated cervical canal, like the fœtal head on the point of exit from the uterus, and the enucleation and removal of the tumor after thorough incision of its capsule is an easy matter and unattended with much danger.

The plans now usually adopted for the extirpation of submucous and interstitial fibroids may thus be summarized:

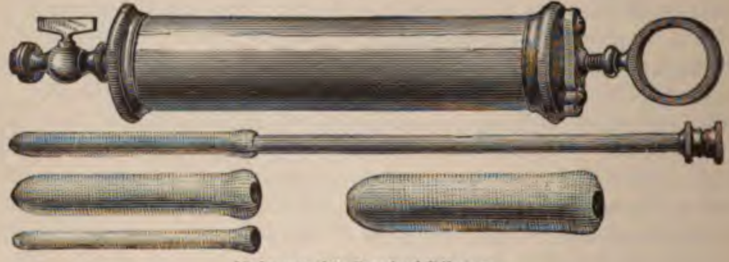
Excision;
Avulsion;
Enucleation.

The two elements which govern success in the removal of these growths by the surgical processes which now come to be considered are these: first, the degree of projection of the tumor into the uterine cavity; second, the degree of dilatation of the cervical canal. We do not say that they decide the propriety of operation. Removal may be practised where the tumor is to a great extent interstitial, only causing slight protrusion inward of the mucous membrane, and where the cervical canal is completely contracted. But in such cases it is more difficult of accomplishment, and much more dangerous to the life of the patient. An interstitial fibroid excites uterine contractions, which in time usually extrude it, making it either subserous or submucous. In both cases it carries with it a covering of uterine tissue, which when it enters the uterine cavity is one of the influences which prevent its expulsion into the vagina; the closure of the cervix being another. In some cases Nature unaided overcomes these obstacles. When they are too powerful for her, Art comes to her aid and removes them.

If the cervical canal be sufficiently dilated to allow of immediate access to the tumor, much danger, delay, and trouble is avoided by that condition. If it be deemed best to force open the way to the neoplasm, the cervical canal may be distended by cutting through it up to the vaginal junction, and giving ergot to expand it, by dilating it gradually by tents, and by forcibly dilating it by water-bags or by graduated dilators. Hydrostatic dilatation is applicable only when the part is dilatable and offers little resistance.

The ordinary water-bags known as Barnes's dilators are not powerful enough for the expansion of the cervix of the non-puerperal uterus, and besides this they dilate irregularly. Molesworth's dilators, shown in Fig. 252, are by far more efficient in these cases. The objection to this instrument, however, is that if not frequently used the rubber tubes become so brittle that when distended with water they are very liable to rupture. Hence we have reluctantly abandoned this instrument, except when we happened to have perfectly fresh tubes.

FIG. 252.



Molesworth's Cervical Dilators.

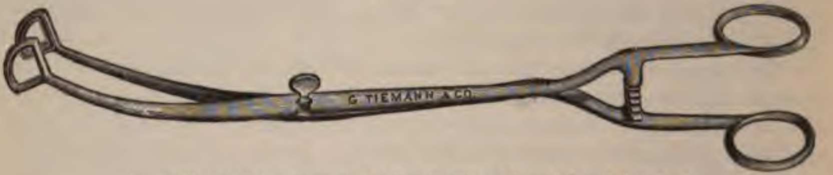
The method which we now chiefly employ, and have found safest and most certain for the dilatation of the canal preparatory to the removal of a submucous intra-uterine fibroid, is to divide the cervix from the external os to the insertion of the vagina bilaterally with scissors; then to incise the internal os with the blunt-pointed bistoury until the resistance of the circular fibres is overcome; and finally secure the necessary additional dilatation by means of large tupelo tents, repeated daily so long as necessary. During all this time ergot is given in doses of gtt. xx of the fluid extract or one grain of the solid extract every three hours, in order to force the tumor into the cervical canal. The faradic current might also be employed daily for the same purpose. These combined efforts may require several weeks or even longer, but should almost inevitably, in time, bring a submucous fibroid, even though it be attached to the fundus, within reach of the scissors, vulsella, and fingers for removal.

Excision.—Formerly a small submucous fibroid projecting into the uterine cavity was removed by the severance of its attachments with the knife, scissors, or some other cutting instrument. For this purpose so-called polypotomes were devised, which acted by grasping the attachment of the tumor and dividing it by means of a blade pushed forward in the handle of the instrument, or the attachment of the tumor was encircled by a loop of wire or a steel chain carried in by an instrument called the écraseur or constricteur, the tightening of which loop through a mechanism in the shaft of the instrument gradually severed the pedicle. These complicated instruments have now been discarded for several reasons, among which may be mentioned the difficulty of applying them to the exact point which it was desired to encircle; the danger of cutting off or drawing into the loop more tissue than was intended, whereby the peritoneal cavity might accidentally be opened; and finally the ease with which these tumors could be removed with perfect safety by the methods already described or still to be considered.

One of the reasons why the écraseur and constricteur were employed for the removal of pediculated intra-uterine tumors or for polypi was the fear of hemorrhage from the severed stump, which was supposed to be arrested by the slow, dull division by the wire or chain. Experience has now shown that such bleeding need never be feared, since the retraction of the attachment of the tumor and the contraction of the body of the uterus almost invariably control the hemorrhage. Besides, the uterine cavity may be tamponed with iodoform gauze if any additional precaution seems advisable. A number of instances are on record in which the separation of the tumor from its more or less broad attachment to the uterine wall by the chain or wire loop has resulted in a perforation of the organ and in the opening of the peritoneal cavity; and these accidents have occurred in the hands of the most experienced operators.

Avulsion.—In certain cases the broad attachment of the tumor to the upper portion of the uterine cavity, the length of the uterine canal, and the difficulty of bringing the tumor within reach of the finger or instruments by which it may be detached entire, oblige us to remove it piecemeal by a method different from that employed in the preceding section. This remark applies as well to comparatively small growths, such as is shown in Fig. 249, as well as to larger (Fig. 250) tumors which resisted the attempts at removal *en masse*. After dilatation of the cervical canal and incision of the capsule or mucous membrane covering the tumor, the instrument shown in Fig. 251 is passed into the uterine cavity, either joined or blade by blade like the obstetric forceps, a portion of the mass is seized, and, the forceps being securely locked, is removed by a steady rotary motion which tears the grasped portion from its attachments. This manœuvre is repeated again and again, under the careful guidance of the finger, until the whole tumor has been removed. It may not be possible to accomplish this in one sitting, but with ordinary precaution as to avoidance of undue force and employment of antisepsis, no bad results need be feared. The more of the tumor that is removed, the smaller does the uterine cavity become and the easier can the tumor be reached. We have thus removed, and seen removed by other operators, tumors varying in size from a fig to a fœtal head. After each sitting the uterine cavity is irrigated with a 1 : 10,000 solution of bichloride, and packed with iodoform gauze to guard against hemorrhage, septic infection, and possible inconvenient closure of the canal. This method of removing fibroids has been called by the French "*morcellement*," meaning removal in pieces.

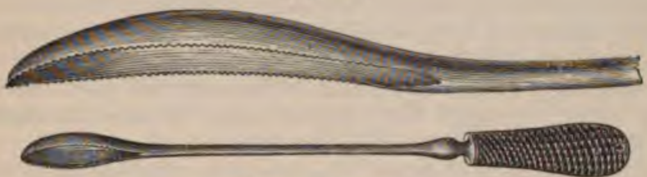
FIG. 253.



Goodell's Avulsion Forceps for Sessile Fibroids and Fundal Polypi.

Enucleation and Traction.—As long ago as 1840, Amussat, at Velpeau's suggestion, performed enucleation of an interstitial fibroid. Anatomical investigations had shown that the attachments of many of these tumors to the surrounding uterine tissue were very loose, and that, after once dividing the layer of mucous membrane and muscular fibres covering the presenting portion of the growth, the tumor could very commonly be shelled out from its bed with the finger or some blunt instrument, without in any way injuring the normal tissues or interfering with the rapid recovery of the patient. Since then this operation of enucleation has been practised by very many gynecologists whose names are too numerous to mention. The one great and almost indispensable condition for the easy and safe performance of this operation is the thorough dilatation of the cervical canal and the easy accessibility of the tumor to both fingers and instruments, so as to enable the operator to work readily and safely. The capsule is then incised to the extent of several inches, the finger inserted and swept about until a sufficient surface of the tumor is exposed to allow of the insertion of a pair of vulsellum forceps. With these steady traction is made, the finger continues the separation of the tumor, and as each successive portion of the mass becomes accessible the vulsella are inserted into it, the traction being steadily kept up. In this manner very soon the tumor is rolled out of its bed, either entirely peeled loose by means of the finger, or by means of the blunt curved scissors, or by an instrument known as Thomas's spoon-saw. In this manner we have succeeded in removing tumors weighing up to three pounds, with invariable recovery of the patient. The large cavity remaining after the removal of such growths should be packed with iodoform gauze, loose mutilated portions of the capsule being removed with scissors. There need be no fear of hemorrhage, since, as already stated, the uterus always contracts sharply after the removal of the tumor. We consider this method of enucleation with traction to be by far superior to any other means of removing submucous and interstitial fibroids from the uterine cavity; but we must again repeat that to the successful and safe employment of this operation the thorough dilatation of the cervical canal and the entire accessibility of the tumor are indispensable conditions. Furthermore, we would except from its performance very large and deeply sessile tumors situated near the fundus uteri, preferring in such cases to postpone operative interference until we have succeeded in forcing the tumor down to the internal os or still deeper. In some cases, notably those where an interstitial tumor is situated at or near the fundus, not impinging on the uterine cavity more than it does toward the peritoneal envelope, and where the cervical canal is long and rigid and undilated, we would infinitely prefer to perform laparotomy, incise the peritoneal envelope, enucleate the tumor, and close the incision by sutures, than to attempt its removal by the natural passages.

FIG. 254.



Thomas's Spoon-saw.

If at all possible, it is advisable to complete enucleation by traction in one sitting; still, we have several times been obliged, through exhaustion of the patient or insufficient dilatation of the cervical canal, to perform the operation in several sittings, each time detaching a little more, with a final successful result; but of course danger of traumatic reaction and of septic infection from these repeated interferences should be borne in mind. We will not, however, deny the occasional utility of freely incising the capsule of the tumor and endeavoring to force it through the incision by the steady administration of ergot; still, whenever it is possible so to incise the capsule that the tumor can be forced through by the uterine contractions, it ought usually to be possible to enucleate and remove it at the same sitting. The serrated spoon-saw, which in our last edition we recommended so highly for the detachment of submucous and interstitial fibroids, is now not used by us with anything like the frequency which it was at that time, for the reason that we found it a rather dangerous instrument if employed without the guidance of the fingers, as it must be in tumors attached near the fundus uteri, and further because by the means already described we were able to remove the growths without a special difficulty. Besides, the instrument has in the hands of a number of gentlemen accomplished damage by perforating the uterine wall.

A plan recommended by Baker Brown and some others many years ago, of mutilating these growths by incisions and punctures and producing their sloughing with the object of gradually effecting their removal, need only be mentioned in order to be condemned. Nature herself occasionally effects these changes, usually with more or less risk to the patient, although many cases are on record where chiefly submucous and interstitial fibroids have become gangrenous, and have been gradually discharged by uterine contractions. Still, the danger of septic infection under these conditions is too obvious to require more than casual mention. In this connection we may say that these tumors occasionally calcify, undergo fatty degeneration, become liquefied, swell, and shrink or are spontaneously absorbed.

Laparotomy, or Abdominal Hysterectomy.—Following in the wake of the ovariotomists, at first unintentionally and eventually by design, the removal of large fibroid tumors of the uterus by abdominal section became an accomplished fact. The first operators mistook the tumors for ovarian cysts, and completed the operation rather than admit their error; some, recognizing their mistake, closed the abdominal cavity without removing the tumor. Such were the cases of Lizars in 1825, Dieffenbach in 1826, and more recently Atlee in 1849, Baker Brown, Cutter, and others. Fourteen of these cases are published, five of which terminated fatally. Other surgeons completed the operation, and the credit of the first successful removal of a large fibroid tumor of the uterus, together with that organ and the ovaries, is due to an American, Burnham of Lowell, Mass., in the year 1853. Kimball of the same city, already mentioned as a pioneer in the electrical treatment of these tumors, closely followed Burnham with a series of cases of removal by laparotomy. Following in their lead, but independently, H. R. Storer of Boston in the year 1866 unconsciously removed the whole uterus with both ovaries by abdominal section, with a fatal result, the exact character of the tumor not being discovered until after removal. Next came Koeberlé of Strasburg, who up the year 1869 had performed 9 hysterectomies with 4 recoveries. His method was to enclose the pedicle of the tumors—that is, the smallest portion of the mass next to the cervix—by a steel wire carried in an instrument called a constrictor, which permitted the gradual tightening of the wire until it firmly encircled the point to be constricted. Hemorrhage was thus prevented, and the pedicle of the tumor held in place after the ablation of the mass above the constricting wire. The abdominal wound was closed, the pedicle being held in the lower angle of the wound by the constrictor.

Péan of Paris was the next to take up this operation, and in a work published by himself and his associate, Urdy, in 1875 he astonished the professional world by his reports of numerous successful cases of fibroid tumors removed by laparotomy. Péan's method consisted chiefly in the diminution of the tumor by excising portions of it after the abdomen was opened, guarding against hemorrhage by compression with large forceps or by the encircling of the pedicle with a metallic ligature twisted by the instrument known as the serre-nœud (or knot-tier) of Cintrat; to prevent the slipping of the pedicle two long steel pins were passed at right angles through the pedicle above the wire. In more recent years (1880) Hegar perfected this operation and introduced the method which is now most generally employed.

In place of the wire loop, transfixion and ligation of the pedicle in sections with strong silk has been practised; clamps also, which were tightened by a screw, have frequently been employed; but at the present day the elastic ligature, composed of solid rubber or of rubber tubing (the latter being the least likely to break), has superseded the other forms of compression of the pedicle. The first to use the elastic ligature for this purpose was Kleeberg of Odessa, on the 8th July, 1876.[1] Many operators, after ligating the stump with strong silk applied in sections, sewed it into the abdominal wound, covering the surface of the pedicle with the abdominal parietes. We saw Billroth perform such an operation in 1886; but the other methods mentioned contained the one salient feature that the pedicle is treated extra-peritoneally, the cut surface of the stump being exposed in the abdominal incision which is closed all around it. In contradistinction to this extra-peritoneal treatment of the pedicle comes the method devised by the late Prof. Schroeder of Berlin, which consists in temporarily constricting the pedicle of the tumor by a ligature, either elastic or otherwise, removing the tumor, and then bringing the surfaces of the pedicle in apposition by means of deep and superficial silk sutures. When all danger of hemorrhage from the stump has thus been guarded against, the latter is dropped into the abdominal cavity precisely as in ovariotomy. This is called the intra-peritoneal treatment of the pedicle.

Indications for the Removal of Fibroid Tumors by Laparotomy.— While an ovarian tumor should, on the general principle that it will infallibly sooner or later endanger the life of the patient, always be removed as soon as recognized, the same rule does not apply to uterine fibroids. So long as they do not affect the life or health of their possessor, either by producing dangerous hemorrhage or by interfering with the comfort or nutrition of the woman through rapid growth and pressure upon vital organs, they need not necessarily be interfered with, since in themselves they are not likely to prove fatal. But when a large subperitoneal or interstitial fibroid tumor shows, by its rapid growth in a comparatively short time, that it will sooner or later interfere most decidedly with the well-being of the patient, or if its size already so interferes, or if by its situation it happens to cause much pain or to obstruct the circulation in some of the abdominal viscera or in the lower extremities, the indication may arise for the only absolutely sure treatment of removing the growth. No hard and fast rule, such as applies to ovarian tumors, can therefore be laid down for the operative treatment of fibroids. Each case should be considered and treated on its individual merits, and the fact should not be forgotten that fibroid tumors seldom kill, and that the operation for their removal is vastly more dangerous than that of ovariotomy. We would therefore advise that the indication for abdominal hysterectomy for fibroids be very carefully and closely limited; and we can truly say that only a very small proportion of such cases which have come under our personal observation have been thought by us to justify the operation laparotomy.

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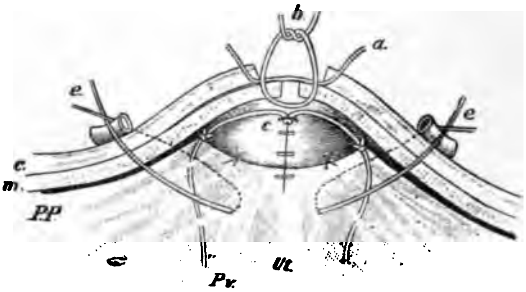
[1] *St. Petersburg med. Wochenschrift*, Nos. 6 and 24, September, 1877.

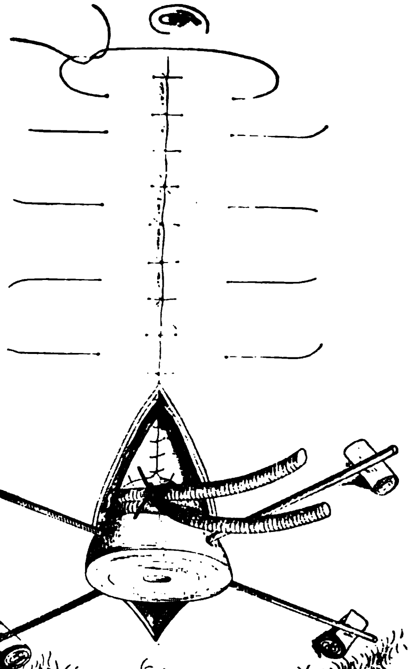
FIG. 255.



Intra-parietal Treatment of Stump (Woelfler-Hacker).
a, *b*, deep and superficial sutures of incision; *c*, skin; *m*, muscle; *e*, *e*, sutures attaching peritoneum stump to abdominal wall; *PP*, parietal peritoneum; *Pv*, visceral peritoneum; *Ut*, uterus.

Operation.—The preparatory details of the operation will be mor fully considered under the head of Ovariotomy, with which up to a cer

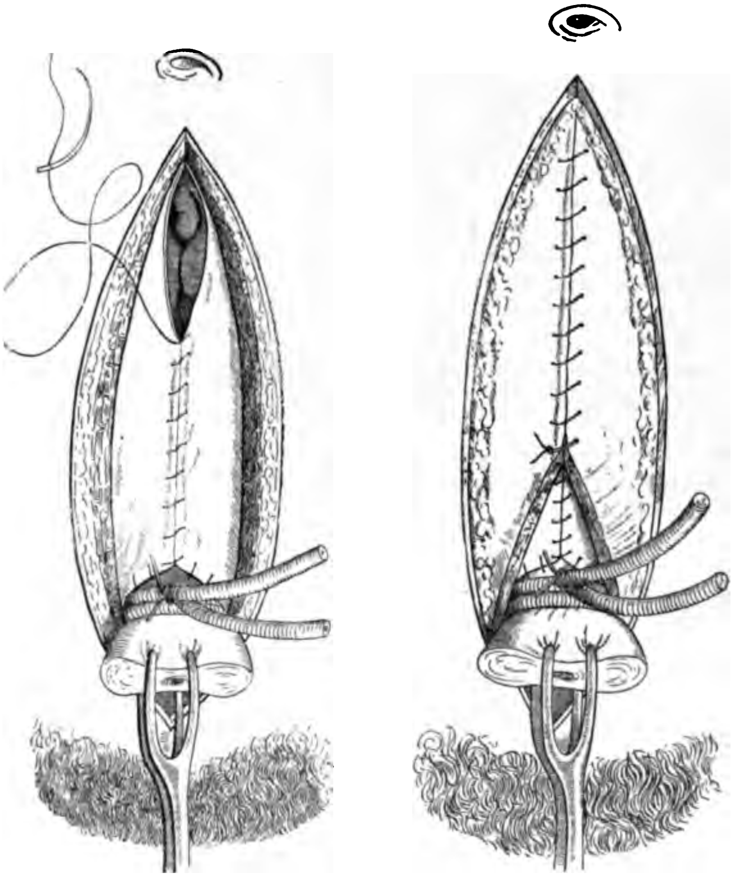
FIG. 256.



Péan's Extra-peritoneal Fixation of Pedicle.
(The elastic ligature is here substituted for the wire loop and serre-nœud.)

oint they are identical. After opening the abdominal cavity in
sual manner, the tumor may be extracted by means of vulsella
s or by a much better instrument first recommended by Tait—
ly, an ordinary corkscrew, or perhaps two or more, which are
ed into the mass at several points, and by means of which the
r is lifted out of the abdominal cavity. If the ovaries have grown
ith the tumor, they are of course attached to its upper portion and

FIG. 257.



gar's Ligation and Extra-peritoneal Fixation of Stump, with peritoneal attachment.

xtracted with it. If, however, the tumor has grown from the
us and has left the lower portion of the uterus more or less unde-
ed, the ovaries may be found well down in the pelvis, and in order
e the smallest portion of the tumor—that is, that situated imme-
ly above the vaginal vault—a separate ligature of each broad lig-
t with the ovarian artery is required, the ligature being applied
le and the broad ligament divided between. In this way the

narrowest portion of the pedicle is set free. Care is of course taken by previous sounding to avoid injuring the bladder. The narrowest portion of the pedicle having been exposed, it is encircled by one of the compressing agents already referred to (clamp, wire, ligature, ligature in sections, elastic ligature, the last three protected by transverse pins), and the tumor is cut off above. If the ovaries have not been included in the mass removed, their attachments should be ligated separately and the organs removed. The pedicle is then treated by one of the methods now to be described in detail, and the abdominal cavity closed. The after-treatment of the patient is carried on after the principles to be described under Ovariotomy.

a. Extra-peritoneal Treatment of the Pedicle.—1. *Péan's Method.*—Transfixion and constriction of pedicle by wire loop, twisted and retained in place by Cintrat's serre-nœud. Two steel pins at right angles prevent the slipping of the loop. The stump is fastened in the lower angle of the wound, which is tightly closed about it. The surface of the stump is charred by means of the actual cautery.

2. *Hegar's Method.*—Elastic ligature, ablation of tumor, stitching of pedicle into lower angle of wound by sutures attaching the parietal peritoneum to the peritoneum of the pedicle below the ligature; careful closure of the abdominal wound, excision of the stump as deeply as possible, also of the cervical mucous membrane; cauterization with saturated solution of chloride of zinc. Some operators (as, for instance, Mundé) employ the steel pins to prevent the slipping of the elastic ligature.

In these extra-peritoneal methods the portion of the stump above the ligature must necessarily slough off. This process can be aided by cutting away dead tissues as the necessity may appear. Careful disinfection and thorough cleanliness will usually prevent septic infection. The objection to this method is the length of time, usually from two to three weeks, required before the sloughing of the stump permits the removal of the ligature, and the subsequent tedious delay in the healing of the wound. Another objection is also the not uncommon persistence of a vagino-abdominal fistula, which requires a separate operation for its closure, both from the vagina and the abdominal wall.

In order to do away with this tedious if not dangerous sloughing process of the constricted pedicle, some operators (Chrobak, Bardenheuer, Martin) have practised the excision of the cervical stump after removing the bulk of the tumor, having of course previously ligated the ovarian and uterine arteries on either side. The wound thus made in the vaginal vault is closed by sutures introduced through the abdominal wound, or it may be left open and drained by iodoform gauze. This complete extirpation of the uterus—body and cervix and all—at one sitting is of course the ideal method, but it is technically more difficult, and therefore more serious to the patient, than the extra-peritoneal treatment of the stump. However, Chrobak (latest report[1]) shows 17 such operations done (after a slightly modified method) during the last nine months, with no death.

b. Intra-peritoneal Treatment of the Pedicle.—Schroeder was the chief advocate of this method. After ligating the broad ligaments with all the vessels on either side with a double thread and dividing between them, the tumor is lifted up, a coil of elastic tubing applied tightly about the cervix, and the tumor removed. A transverse wedge is now cut out of the stump down to the elastic ligature, any projecting vessels are seized separately and ligated with catgut, the cervical mucous membrane is exsected, and the edges of the incision are then brought together at different levels; the cervical canal being first sutured, then the deeper portions of the wound, and finally the peritoneum brought together over the surface of the stump by interrupted silk sutures. The elastic ligature is then removed, and after thorough cleansing of all the parts and the assurance that no hemorrhage is taking place, the stump is returned to the abdominal cavity and the wound closed.

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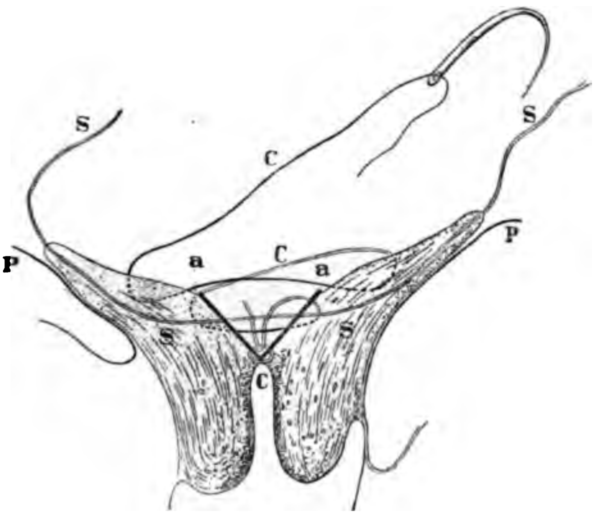
[1] *Centralbl. für Gyn.*, Aug. 29, 1891.

FIG. 258.



Intra-peritoneal Treatment of Stump (Schroeder, Kelly, etc.)

S, deep silk suture passed first under the whole denuded surface; C, continuous catgut sutures composed of superimposed turns covering the whole of the wound, of which the lower part is marked by a broad black line, *a a*, formed by the cauterized uterine cavity; P, peritoneal coat.

There are numerous modifications of the principle of both the extra- and intra-peritoneal methods. Saenger, Zweifel, Tauffer, Woelfler, and Howard Kelly may be chiefly mentioned as having introduced more or less original and valuable improvements of these two modes of operation. In fact, every operator of repute may be said to have some special method of his own which he prefers to any other. Our space does not permit us to treat of all these modifications and methods in detail.

The question as to whether the extra-peritoneal or the intra-peritoneal treatment of the pedicle is the safer and preferable is not as yet entirely settled. There can be no doubt that the intra-peritoneal treatment of the pedicle devised by Schroeder is really the ideal one, since by it the pedicle is dropped as in ovariotomy, and, if all goes well, is henceforth entirely lost to view, and the abdominal cavity is at once closed and union by first intention is allowed to take place. But, unfortunately, the nature of the tissues involved in this operation differs from that met with in ovariotomy. The thick, unyielding uterine neck is liable to shrink, and thus allow the ligatures to relax and hemorrhage to occur. Further, the dangers of septic infection and of peritonitis are greater after hysterectomy than after ovariotomy. The deaths which have occurred after the intra-peritoneal treatment of the stump in hysterectomy have been due to one of these three causes. By the extra-peritoneal method the offending pedicle is constantly kept in view and accessible to whatever treatment it may require. Hence hemorrhage and septic infection are practically impossible, and peritonitis is the only danger to be feared. So far, the majority of operators have achieved the best results from the extra-peritoneal method.

The following tables, taken from Pozzi's recent treatise on gynecology, give the comparative results of the two methods, according to Wehmer:[1]

a. Intra-peritoneal Method.

	Number of Operations.	Deaths.	Mortality.
Gusserow . . .	19	6	31.6%
Kaltenbach . .	5	3	60.0%
Martin	86	15	17.4%
Olshausen . .	29	9	31.0%
Spencer Wells .	26	10	38.0%
Schroeder . . .	135	41	30.0%
Tauffer	12	4	33.0%
	312	88	28.2%

b. Extra-peritoneal Method.

	Number of Operations.	Deaths.	Mortality.
Bantock . . .	22	2	9.0%
Hegar	22	6	27.0%
Kaltenbach . .	22	1	4.5%
Keith	38	2	5.3%
Péan	52	18	34.0%
Tauffer	17	2	11.7%
Spencer Wells .	20	10	50.0%
Lawson Tait .	54	20	37.0%
Thornton . . .	15	2	13.0%
	262	63	24.0%

Since in the above tables there are some of the most avowed partisans of the extra-peritoneal method represented in both the intra- and extra-peritoneal lists, in order to arrive at statistics free from this objection the following table has been prepared by Pozzi of intra-peritoneal operations performed solely by men who practise this method only:

	Number of Operations.	Deaths.	Mortality.
A. Martin	86	15	17.4%
Olshausen	29	9	31.0%
Schroeder	136	41	31.1%
Gusserow	23	6	26.0%
Schultze	12	3	25.0%
Werth	11	3	27.2%
Dohrn	9	0	0.0%
Leopold	19	7	36.8%
Runge	11	4	36.3%
Zweifel	10	1	10.0%
	345		

The mortality drops in this list to 25.5 per cent., but, as Pozzi says, if we eliminate from the extra-peritoneal lists the cases of certain notorious partisans of the other method, we find the mortality also to drop to 21.6 per cent.; therefore, still far less than the best percentage from the intra-peritoneal method. Fritsch[1] has had but 5 deaths out of 23 operations treated by the extra-peritoneal plan (modified according to Woelfler-Hacker, the pedicle being attached between the lips of the incision), against 11 deaths out of 27 from the intra-peritoneal method. Albert[2] had but 1 death out of 30 operations by the extra-peritoneal, and Tauffer[3] 12 deaths out of 51 by the same method. C. Braun and Hegar report equally good results—the first, 38 operations with 6 deaths; the second, 32 with 2 deaths. We ourselves, except in a number of instances of pediculated fibroids in which we simply pierced and ligated the pedicle and dropped it back precisely as in ovariotomy, confess ourselves decided adherents to the extra-peritoneal method, having seen no special inconvenience from its employment, and no danger except that of peritonitis, which pertains to a certain extent more or less to all abdominal sections. If the pedicle was so thick that it was difficult to ligate, or if the tumor extended down into the pelvic cavity, we have succeeded in reducing the size of the pedicle by excising a portion of it, or in the latter case by enucleating the pelvic portion of the mass. The possible persistence of an abdomino-cervical fistula we have already referred to as one of the objections to this method. In former years we employed as a means of constricting the pedicle a stout piano wire adjusted and twisted by the Cintrat serre-nœud or the Maisonneuve constricteur, later on the clamp devised by Thomas; but of recent years we have found the elastic ligature, protected against slipping by pins, to be the most convenient and easy method of constricting the pedicle. After the gradual excision of the sloughing stump and the removal of the pins, which usually takes place about the twelfth to the sixteenth day, the elastic ligature comes away by itself or is divided and removed. To guard against septic infection we have cauterized the stump with a saturated solution of chloride of zinc; if very vascular, have even seared it thoroughly with the Paquelin cautery and kept it carefully dusted with iodoform. In no instance have we seen septic infection proceed from the stump treated in this manner. Such of our cases as we have lost have died from peritonitis or from unsuspected adhesion of intestines to the intra-peritoneal portion of the pedicle.

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[1] *Zeitschrift f. Geb. u. Gyn.*, xiv. 134, 1887.

Dangers of Hysterectomy.—Abdominal hysterectomy for fibroids of the uterus is more dangerous than ovariotomy, because the organs removed are more vascular, hemorrhage is more likely to occur at the time of the operation and subsequently, the operation itself is more difficult and prolonged in consequence of the impossibility of diminishing the tumor before it has been extracted from the abdominal cavity, the almost inevitable shock attending the exposure of so large a mass of highly vascular serous membrane, and finally the septic infection likely to result, in spite of most careful antiseptic precautions, from the possible decomposition of the stump.

The dangers may therefore be formulated briefly as—first, primary or secondary shock or collapse; second, primary or secondary hemorrhage; third, peritonitis; fourth, septicæmia. As a rule, it is a safe plan to consider the occurrence of shock in all abdominal operations to be due to loss of blood rather than to nerve influence, and to look for the source of the bleeding when shock suddenly appears. The statistics cited above show indisputably that our modern methods of surgery, combined with antisepsis, and especially in the hands of operators accustomed to the frequent performance of abdominal section, have rendered even this formidable operation comparatively safe, so that where in former days 50 to 75 per cent. perished under the hands of the surgeon, at present the mortality has dropped to from 21 to 25 per cent.

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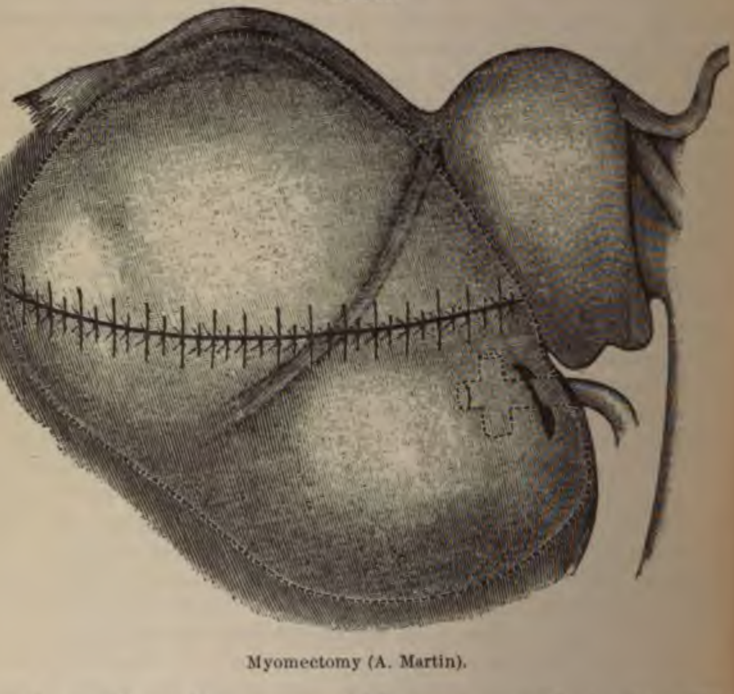
[1] *Volkmann's Sammlung klin. Vortr.*, 1889.

[2] "Laparotomien wegen Uterusmyomen," *Wien. med. Presse*, 88, 1889.

[3] *Centralblatt f. Gyn.*

Myomectomy.—To A. Martin of Berlin is due the credit of having introduced and perfected the method of enucleating large subperitoneal interstitial fibroids through an abdominal incision. He splits the capsule freely, peels out the tumor, and sews the walls of the cavity together by deep interrupted sutures, often draining the cavity toward the vagina if such a precaution seems to him necessary. (See Fig. 259.)

FIG. 259.



Myomectomy (A. Martin).

Other forms of uterine tumors which are removable in this manner are those that develop between the layers of the broad ligament, growing down either into the pelvic cavity alone or separating the post-parietal peritoneum from its attachment, even, as we have seen, as high up as the false ribs. Such tumors have no pedicle, are supplied by abundant, exceedingly large and tortuous vessels, and are extremely difficult of removal except by the process of incising their capsule and peeling them out from their bed. Of course, if the cavity should be very large it might be impossible to unite its walls by sutures, and it would have to be packed tightly with iodoform gauze, which is brought out of the abdominal wound, the edges of the incision in the sac being stitched to the edges of the abdominal wound. Olshausen, Hegar, Fritsch, and others, chiefly German operators, have followed the lead of Martin in this operation, and achieved excellent results. As yet, however, this method may be said to be less popular than the removal of the whole uterus together with the fibroids. It should be added that Martin and several other operators have enucleated myomatous tumors in this manner from the pregnant uterus, and that pregnancy has gone on uninterruptedly to term.

Oöphorectomy for Fibroid Tumors.—In January, 1876, Trenholme of Montreal first operated on a case of bleeding fibroids by the removal of the ovaries in order to bring about the premature menopause and the consequent shrinking of the uterine tumor. His case was successful. Hegar performed the same operation independently in August of the same year. Lawson Tait claims that he did the same operation in 1872, but published his claim after the reports of Trenholme and Hegar. The operation is now known as that of Hegar, chiefly in consequence of the number of times it has been performed by him and of his pre-eminent writings on the subject.

Indications.—It is indicated in cases where excessive menstrual or intermenstrual hemorrhage is caused by a uterine tumor, or where more or less constant and intense pain is produced by the same factor, the removal of which, for reasons of inaccessibility or general debility of the patient, is inadvisable. Here the comparatively trifling and safe operation of removal of the ovaries, which entails substantially no loss of blood whatever, comes under consideration. It should, however, not be lightly undertaken, because in certain fibroids the ovaries are carried so far away from the median line by the growth of the tumor, or have become so much disorganized and are supplied with such distended blood-vessels, that their removal is exceedingly difficult, and attended with almost as much danger as would be the extirpation of the uterus with the offending growth. Where, however, the ovaries can be easily removed, together with the tubes, the effect, in our experience, upon the hemorrhage and upon the growth of the tumor has been most excellent. The bleeding has ceased rapidly and usually totally, and a more or less speedy retrogression of the tumor has taken place. As regards the dangers of the operation, Hegar lost 6 patients out of 55 operations; a table prepared by Tissier gives 25 deaths out of 171 operations; Lawson Tait reports 262 operations with a mortality of 1.25 per cent.

The Curative Results as regards the Hemorrhage are given by Hegar as, out of 34 cases, 20 times immediate cessation of the hemorrhages; 4 times cessation after a few irregular discharges; 1 time persistence of the irregular metrorrhagia; 1 time temporary menopause, then hemorrhage and cystic development of the tumor; 1 time menopause, then hemorrhage, requiring enucleation of the tumor; Tissier, out of 146 cases, 89 of complete cessation, 21 times menopause after a more or less long period of irregular hemorrhages, 10 times return of the menstruation after a short respite.

Results as regards the Diminution of the Tumor.—Hegar, 22 times marked diminution, twice no diminution, etc.; Tissier, 66 times rapid diminution, 71 times no mention (the patient is reported cured), 9 times no change.

It will be seen from these statistics, which we have not sought to make as complete as we might easily have done with more labor, that the removal of the ovaries does actually arrest the bleeding caused by fibroid tumors and check the growth of these masses. Whether it would produce a diminution or absorption of very large, hard, subperitoneal tumors is doubtful, since the vascular supply of these tumors is comparatively limited when they have once attained a large size (except those which develop between the layers of the broad ligament), and because their growth is very little influenced by the function of the ovaries. It is chiefly interstitial tumors of a soft variety, which cannot be reached through the cervical canal with sufficient ease to allow of their removal by this passage, and large, very vascular, also interstitial masses, the extirpation of which by laparotomy would prove too dangerous, which call for the consideration of the operation of oöphorectomy.

[Before concluding this chapter I wish to state my conviction that the pathological influence of fibroid tumors as a whole is over-estimated by the profession at large, and that many women are made unhappy by the knowledge, incautiously imparted to them by their medical attendant, that they have a tumor of this kind. Feeling satisfied, as the result of many years' experience, that a large proportion of these tumors cause no serious symptoms whatever, and in no way threaten the lives of their possessors, I made this subject a study several years ago, and found that my own observations during the years from 1886 to 1889 showed a record of 123 instances of fibroid of the uterus, or 4.14 per cent. of all the gynecological cases seen during that time. Of these 123 cases, but 62 required treatment of any kind whatsoever, in my estimation. The remaining 61—that is, about one-half—afforded their owners so little inconvenience or gave so little prospect of becoming troublesome that not even a medical treatment was thought necessary.

The methods of treatment employed in the 62 cases were—

Uterine Fibroids from October 1, 1886, to September 1, 1889.

		TREATMENT.							SUMMARY	
	Number.	Hysterectomy.	Oöphorectomy.	Curette.	Enucleation.	Torsion.	Galvanism.	Medication.	Treated.	No treatment required.
Corpus Uteri.										
Subperitoneal	64	6	2	. .	. .	. .	4	. .	12	52
Interstitial	31	. .	1	10	2	. .	4	5	22	9
Submucous	19	. .	. .	10	6	. .	. .	3	19	
Cervix Uteri.										
Interstitial	2	. .	. .	. .	2	. .	. .	. .	2	
Polypi	7	. .	. .	. .	. .	7	. .	. .	7	
Total	123	6	3	20	10	7	8	8	62	61

The following were the conclusions derived from an analysis of these cases, added to my experience of previous years:

1. On general principles the rule may be laid down that fibroid growths of the uterus situated near the fundus uteri and showing no tendency to downward development, if requiring active treatment are best reached from the abdominal cavity.

2. Tumors, on the other hand, situated near the internal os, and, either of their own accord or under the influence of oxytocic measures, showing an inclination to dilate that orifice and encroach upon the cervical canal, can almost always, after due preparation, be removed safely through the vagina.

3. About one-half of all fibroid tumors which attract the attention of their possessors and come under the observation of the physician require no active treatment of any kind.

4. Only interstitial and rapidly-growing subperitoneal tumors call for or are benefited by galvanic treatment.

5. The removal of the hypertrophied mucous membrane of the uterine cavity by the sharp curette will often relieve, at least temporarily, the menorrhagia which is the chief symptom present in the interstitial variety.

6. Enucleation, after splitting of the capsule by means of traction with the finger and some blunt instrument, usually offers a safe means of cure in cases of submucous corporeal and interstitial cervical tumors.

7. In certain cases of interstitial tumors which are so situated as not to be amenable to the compressing influence of ergot, but still affect the general health by profuse, uncontrollable hemorrhage, and again in certain cases of rapidly-growing subperitoneal tumors in which a thin pedicle cannot readily be formed, the removal of the ovaries may be confidently expected to check the hemorrhage and growth of the tumor respectively.

8. Laparo-hysterectomy should not be lightly undertaken, and should certainly never be performed merely to relieve the patient of a fibroid tumor which does not affect her general health and is merely inconvenient or unsightly.

9. The nearer the prospective menopause, the less likely is the fibroid to grow or cause trouble, and therefore, *cæteris paribus*, the less are active or operative measures called for.[1]—P. F. M.]

Fibro-cystic Tumors of the Uterus.

While we have referred to cystic degeneration of fibroids of the uterus as one of the varieties of that disease, we have not thought it convenient to consider this particular form in detail in the preceding pages. Our reason for this was, that this fortunately rather rare variety usually occurs only in large interstitial or subperitoneal tumors which develop upward into the abdominal cavity, and so closely simulate complicated ovarian tumors as to mislead even the most experienced diagnostician. It is for that reason that we prefer to describe these tumors under a separate section, although we do not think them worthy of a special chapter. The exact pathological condition of these fibro-cystic tumors of the womb is not as yet fully known; all we can say is, that we find large tumors of the womb, springing usually directly from the body of that organ by a broad attachment, in the centre of which exist one or more cavities containing a large quantity of usually thin yellow or colloid fluid. What has caused these tumors, which were probably originally solid, to degenerate and liquefy is, so far, unknown to us. These tumors may be either intra-peritoneal, as is usually the case with fibroids springing from the body of the uterus and developing into the abdominal cavity, or they may be extra-peritoneal, having developed between the layers of the broad ligament, and may then so far push up the peritoneum as to encroach upon the abdominal cavity and simulate the intra-peritoneal variety.

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[1] P. F. Mundé, "The Methods and Limitation of Treatment for Uterine Fibroids," *Trans. Am. Gyn. Soc.*, 1889.

Symptoms.—The symptoms are usually those common to large abdominal tumors of a fibroid character—namely, abdominal enlargement and pressure upon neighboring organs. As a rule, these tumors do not cause profuse menstruation or affect the health of the individual.

Frequency.—This fibro-cystic degeneration is fortunately not very common; still, a sufficient number of cases occur to give almost any physician who makes gynecology a specialty an opportunity to see a number of them and to test his powers of diagnosis.

Differential Diagnosis.—The chief difficulty in the diagnosis of these tumors is to distinguish them from large multilocular cysts of the ovary. The diagnostic signs pertaining to the latter apply almost without exception to the former. As a rule, in tumors springing from the ovary the length of the uterine cavity remains normal; that is, the sound enters only to a depth of two and a half inches; in tumors springing from the uterine body, however, the length of the uterine cavity is very often more or less increased, up to five, six, or more inches. This differential sign may be of value in interstitial uterine growths to distinguish them from certain kinds of ovarian tumors; but it unfortunately fails in fibro-cysts of the uterus, which grow away from the uterine body and leave the cavity of the organ of entirely normal length. The examination of the fluid of a fibro-cyst of the uterus removed by aspiration unfortunately gives no distinct evidence of the character of the tumor. It is usually, as remarked, of a light straw color, and the so-called ovarian corpuscle of Drysdale is not found in it. The fluid also coagulates on standing, like the serous fluid removed from the peritoneal cavity in cases of abdominal dropsy. But these signs are uncertain and not to be relied upon. One sign upon which we lay the greatest stress is that in fibro-cysts of the uterus the general health of the patient is usually not affected. There is, in fact, none of the cachexia which is very truly considered a distinctive symptom in the advanced stages of ovarian tumors. Our experience has led us to feel that in any case of a large abdominal cystic tumor which had been growing for a certain number of years, if the health of the patient is entirely unaffected, her color good, her strength undiminished, we should, unless the physical examination decidedly pointed to ovarian disease, proclaim ourselves in favor of a fibro-cyst of the uterus. The diagnosis, however, between these two conditions is so very difficult to make that no surgeon who has had the opportunity to perform a number of abdominal sections for ovarian and uterine tumors can deny, if he is willing to own the truth, that he has failed to discover in one or more instances that a fibro-cyst of the uterus was such until he had opened the abdominal cavity and explored through that opening the attachments of the tumor. Spencer Wells speaks of a darker hue of the cyst-wall, which might lead the operator to suspect that he is not dealing with an ovarian tumor; and we can corroborate his statement.

Treatment.—Ordinarily, the treatment of fibro-cysts of the uterus does not differ from that of large subperitoneal fibroids of that organ which under certain conditions, as already described, warrant or call for operative removal. As we have already stated, the diagnosis is usually not made until the abdominal cavity has been opened. In several such instances we have been tempted to close the incision and leave the tumor alone as soon as we discovered the error of diagnosis. We regret to say that we did not do so—that we attempted the removal of the tumor; found its attachment to be such that this could be effected only after long and patient labor and with great difficulty. The patients succumbed to the shock of the prolonged operation. After evacuating the fluid, if this is decided to be done, or if this has been done accidentally before the correct diagnosis was made, the removal of the sac, with as much of the uterus as seems necessary, should be performed on the same principles as already indicated.

In cases where the attachments of the fibro-cyst are so extensive, or its vascularity so great, as to render its complete extirpation too hazardous, the cyst might be opened by a large incision, the fluid thoroughly evacuated, and the sac-wall stitched into the abdominal wound, as is done with unremovable cysts of the broad ligament and intra-ligamentous ovarian cysts. The cavity is then packed with iodoform gauze, and allowed to shrink and fill by granulation. We think this method far preferable to the removal of the whole tumor at all hazards. Any redundancy of the sac can be removed before it is stitched to the abdominal wound.

Removal of the fluid by tapping, repeated when necessary, may be allowed in these cysts when they cannot be removed. In ovarian cysts, as will be stated later on, tapping is no longer thought proper treatment under any circumstances, since removal can usually be effected.

Synopsis of Operative Treatment of Different Varieties of Uterine Fibroids.—The following table from Pozzi's recent work on gynecology seems to us very comprehensive and instructive, and substantially agrees with our own views:

Large and non-vascular pedicles (without opening the uterine cavity).	Ligature or sutures with silk or catgut, and dropping of the pedicle according to the method of Schroeder.
Hollow and non-vascular pedicles (with opening of the uterine cavity).	*a.* If the pedicle is of sufficient length, extra-peritoneal treatment, according to Hegar. *b.* If insufficiently long, mixed treatment—methods of Woelfler-Hacker or Saenger.
Very vascular pedicles.	*a.* Sufficiently long, extra-peritoneal treatment, after Hegar. *b.* Insufficiently long, mixed treatment with elastic ligature, after Saenger. *c.* Excessively short, intra-peritoneal treatment with elastic ligature buried, according to Olshausen, or total hysterectomy, after Bardenheuer.

No pedicle; interstitial or submucous tumors, easy of enucleation.	*a.* Lateral portions of the uterus very vascular, supravaginal hysterectomy and extra-peritoneal treatment of the pedicle, after Hegar. *b.* Posterior or anterior surface of the uterus slightly vascular, enucleation, suture of capsule, and dropping of uterus (method of Martin). *c.* The same, enucleating, opening of the uterine cavity during enucleation, supravaginal hysterectomy, extra-peritoneal treatment, after Hegar.
No pedicle; tumor enclosed in the pelvic cellular tissue or between the layers of the broad ligament.	*a.* Small tumor easily enucleable, enucleation, deep suture of the sac, no drainage. *b.* Large tumor easily detachable from the uterus, large cavity or pocket bleeding freely, enucleation, pressure, resection, and superficial suture of the pocket and drainage by the vagina (Martin), or drainage through the abdominal wound, according to circumstances; in case of need tamponade with iodoform gauze; uterus left uninjured. *c.* The same with firm and bleeding attachments to the lateral portions of the uterus, supravaginal hysterectomy, treatment of pedicle as above, suture and drainage of the sac, with or without tamponade.

CHAPTER XXXVII.

UTERINE POLYPI.

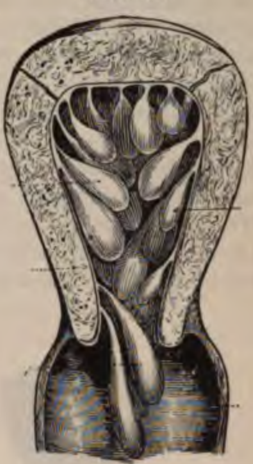
A UTERINE polypus is a fibroid tumor of the uterus which has gradually been forced down into, or even out of, the uterine cavity by means of the contractions of the organ, and which then is connected with its original site by a comparatively small attachment known as a pedicle. The polypus is covered with uterine mucous membrane, and perhaps also by a certain amount of uterine muscular tissue. Its attachment may be very small, not broader than that of the little finger, or equal in diameter to the largest breadth of the tumor.

Other pediculated masses projecting into the uterine cavity are designated by the name of polypus, but are not truly such: they are the result of an accumulation of blood-fibrin around a nucleus springing from the placental site after a confinement at term or a miscarriage. They are composed of fibrous tissue, are not supplied with blood-vessels, and are not firmly attached to or incorporated with the tissue of the uterus. They are simply compressed blood-clots depending from the placental site. To distinguish them from the fibrous or true polypi these blood-clots are called fibrinous polypi. In fact, they are not real polypi at all, and are mentioned here only for the purpose of distinguishing them from the true variety.

History.—That these formations occur was known in remote antiquity of medical history; but little attention was paid to them and their exact origin and nature was not understood. Still, the name of polypus has clung to them for hundreds of years, and has become a familiar term with the laity. The revival of the French school of medicine in the seventeenth century helped to throw light on this subject, and since then gradually it has become so familiar that the true nature of these tumors is no longer in doubt.

Varieties.—There are two varieties of uterine polypi—glandular and fibrous. First, cystic and hypertrophic enlargement of the glands of the cervical cavity, which eventually may dilate the cervical canal, escape from the external os, and grow down even as far as the vaginal orifice. Second, those springing from interstitial or submucous fibrous or myomatous tumors which have gradually grown or been forced into the uterine cavity, and in virtue of the formation of a pediculated attachment have assumed the character of a polypus.

Fig. 260.

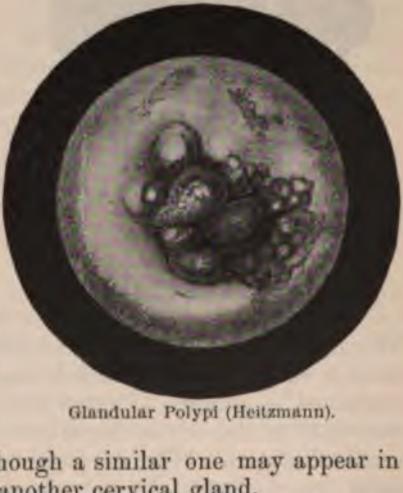


Glandular Polypi (De Sinéty).

Glandular Polypi.

Pathological Anatomy.—These polypi, as already indicated, are merely hypertrophic cervical glands filled with the viscid fluid normally secreted by those glands, and usually associated with a certain amount of hypertrophy of the mucous lining of the cervical canal. They are either unilocular—that is, composed of one enlarged gland only—or more usually multilocular, in accordance with the racemose character of these glands. They may spring either from the cervical cavity proper at any point between the external and internal orifices or from the vaginal surface of the uterus itself. They are benign in character, and seldom attain a size larger than that of a small egg, their usual size being that of a bean. Once removed, the same polypus never returns, although a similar one may appear in consequence of the enlargement of another cervical gland.

Fig. 261.

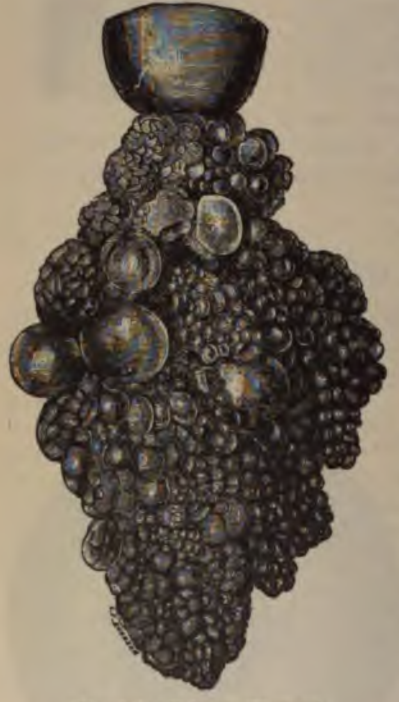


Glandular Polypi (Heitzmann).

Adeno-myxo-sarcoma of the Cervix.—Very rarely these glandular polypi develop to an enormous size, so as to not only fill the vagina, but even protrude from the vulvar orifice. Of the few cases of this kind reported, the larger number proved to be eventually of a semi-malignant type, the central portions having assumed a sarcomatous formation, and their removal was only followed by a temporary relief; a speedy recurrence of the growth and the death of the patient from exhaustion being the result.

The nature of these tumors is partly glandular, partly colloid in consequence of the peculiar viscid character of the fluid they contain, and partly malignant or sarcomatous. They have therefore been called adeno-myxo-sarcoma or myo-sarcoma striocellulare uteri (Pernice[1]). We have both chanced to see each a typical case of this rare disease. In the last edition of this book, on p. 560, appears a diagram of a tumor of this kind seen by Thomas (Fig. 262), the length of which was four and a half inches. It sprang from the inner wall and lip of the cervix, caused no symptoms except leucorrhœa and pelvic neuralgia, and was not known to exist until difficulty in sexual intercourse caused the patient to apply for examination. The mass was examined after removal by Dr. F. Delafield, and found to consist of enlarged cervical follicles. It was removed with great ease by the écraseur; whether it ever returned or not is not known. A comparison with the other tumors mentioned in this list, particularly the absence of cachexia, would seem to show that this growth was benign. The other case was seen by Mundé in 1888, and is fully described in the February (1889) number of the *American Journal of Obstetrics*. The patient was a young girl of nineteen, who for two years had suffered from a profuse watery vaginal discharge. The vaginal canal was found completely filled with a nodular, slimy, friable tumor which even protruded between the labia. The centre of the tumor seemed firm. It was removed with the constrictor wire by Mundé, and it was then found that the vaginal vault contained a number of cysts filled with gelatinous fluid. The fluid oozing from the tumor resembled jelly, or, perhaps better, a mass of crushed grapes. The supposition that the centre of the tumor was solid was confirmed by the wire loop, which creaked audibly on cutting through it. The mass sprang from the whole cervix, the body

FIG. 262.



Glandular Polypus (Thomas).

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[1] *Virchow's Archiv*, July 3, 1888.

of the uterus being entirely uninvolved. The microscopic examination showed that this mass was undergoing sarcomatous degeneration in its central portions. The tumor returned within two months, and the patient soon died from exhaustion. In Pernice's article we find first the report of his own case (Fig. 263), which resembled very much the one reported by Mundé (first removal by excision, two months later recurrence of the tumor, removal by the galvano-cautery wire, nine months later laparotomy for large abdominal tumor, death of patient). Microscopical examination showed myxoid degeneration of the first tumor, sarcomatous degeneration of the second and third tumors.

Mundé two years ago[1] (1889) was able to find only nine cases in all of this singular and destructive disease—namely, Thiede, Rein, Spiegelberg, Winckel, Weber, Thomas, Pernice, and Mundé. We believe that Fenger of Chicago has since reported an additional case of this kind.

Symptoms.—The symptoms produced by glandular polypi of the cervix are usually those of a profuse leucorrhœal, more or less acrid, discharge or of a bloody flow, which may, even in very small tumors of this kind, be eventually so profuse as to cause decided anæmia. We have seen glandular polypi not larger than a bean almost exsanguinate the patient. The irritant character of the discharge may produce a vaginal and vulvar irritation sufficient to render the patient miserable; and it is this symptom which usually first induces her to seek professional advice. The semi-malignant variety of glandular polypi above mentioned makes itself known by a rapid deterioration of the general health of the patient, produced by the excessive serosanious vaginal discharge.

Physical Signs.—The finger detects a small growth dilating the external os or protruding from it. Occasionally it may occupy the larger part of the vaginal canal. We do not remember ever having seen one larger than a hen's egg. Examination produces more or less hemorrhage, but is not attended with any special pain. The uterine cavity is not elongated and the uterus not enlarged. The attachment to the cervical canal can very easily be ascertained by means of the sound or by inspection through the speculum.

Course and Termination.—Unless removed, these little tumors will probably remain indefinitely, although not infrequently the slender pedicle becomes torn by accident or sloughs through, and the tumor is expelled spontaneously.

Prognosis.—The prognosis is always good, except in the myxosarcomatous variety already described. A cervical catarrh invariably exists in connection with these polypi, and may indeed be said to have been the original cause of their formation.

Treatment.—The treatment is exceedingly simple, and consists in grasping the polypus with an ordinary dressing-forceps or a broad polypus-forceps and twisting it around until the pedicle is severed. In order to cure the primary disease—that is, the cervical catarrh—the use of the sharp curette, followed by nitric acid, as described in the

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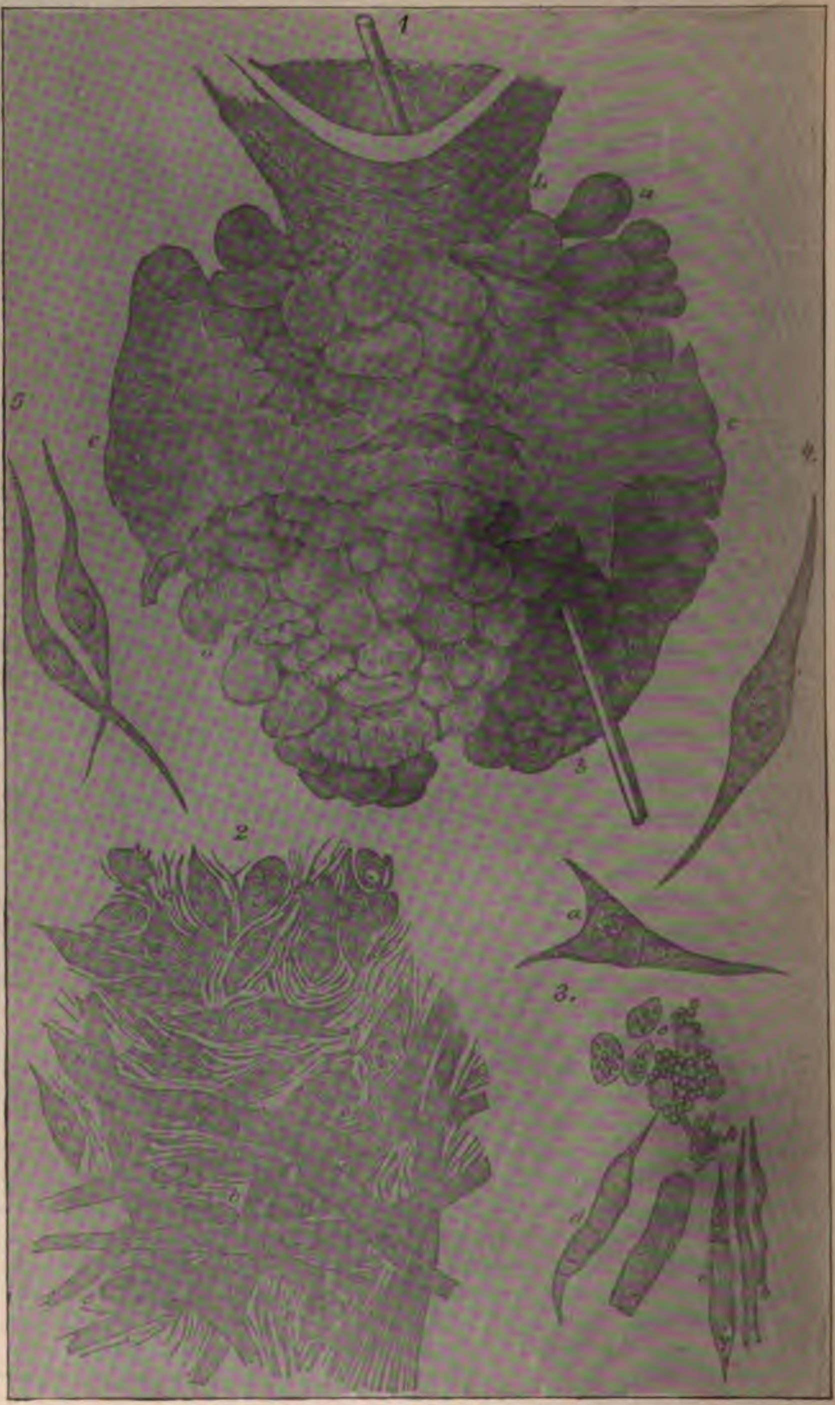
[1] *Loc. cit.*

FIG. 263.



A Grape-like Myxo-sarcoma (Striocellulare Uteri (Pernice)).

chapter on Cervical Endometritis, is advisable. No more brilliant, speedy, and permanent success can be achieved in the department of gynecology than by the removal of a polypus, whether of the granular or fibrous variety, and the immediate cessation of the symptoms and the rapid return of the patient to health.

Fibrous Polypi.

These tumors are of vastly greater importance than the comparatively insignificant ones just described. Undoubtedly, it is the thing to be desired in all cases of fibroid tumors which show a tendency to grow toward the uterine cavity that they should eventually—and the sooner the better—become pediculated and present themselves at or through the external orifice of the uterus, so as to permit of their easy and safe removal. It should, therefore, be our object, whenever such a possibility seems to present, to endeavor to force the fibroid into the uterine cavity and toward the vaginal canal by means of all agents which excite uterine contractions and dilate the uterine canal. Such are—ergot, the faradic current, dilatation and discission of the uterine canal, and tamponade of the vagina. These methods have already been discussed in the previous chapter.

Pathological Anatomy.—A fibrous polypus is covered by mucous membrane, more or less muscular fibre, and is composed of fibrous tissue, intermixed more or less with muscular elements of the uterus. A few instances are on record where the central portion of the polypus contained fluid, evidently in consequence of a myxomatous degeneration of a portion of the fibroid. Such polypi have been described as hollow polypi, but they are of no special pathological significance, being interesting only in that they may possibly be mistaken for an inverted uterus. Such a mistake should, however, not be made if the differential points between inversion and polypus are borne in mind, chiefly the presence of the body of the uterus above the symphysis pubis in polypus, and its absence in inversion.

The attachment of fibrous polypi may be at any point of the uterine cavity and of variable thickness. If a fibroid polypus has escaped into the vagina, usually its attachment to the uterine wall is comparatively limited; if, however, the polypus springs from near the fundus uteri, its insertion may be as broad as the diameter of the polypus.

The size of these tumors varies greatly, from a hickory-nut to a fœtal head, or even somewhat larger. We have seen a number of cases in

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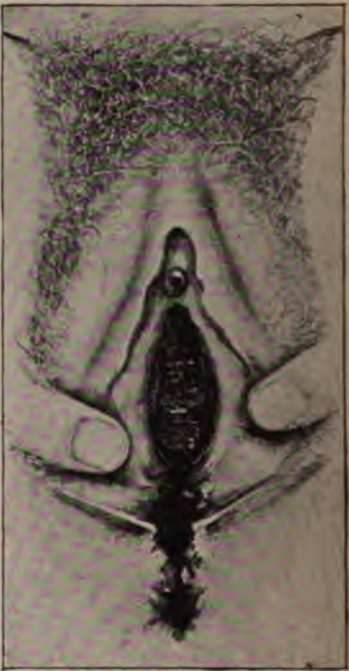
EXPLANATION OF FIG. 263 (on page 550).

1. Cervix uteri, with tumor hanging from it (natural size). Sound passed through cervical canal. *L*, a line of excision: *a*, *a*, and *b*, berry-like growths; *c*, fragments of delicate epithelial membrane covering a number of the berries.
2. Section of a berry hardened in alcohol (Bénèche, Oc. 3, Obj. 7): *a*, type of stroma; *b*, numerous interlacing striated muscular fibres; *c*, fibres in which the striæ cannot yet be seen; at times, *e*, these fibres are cut transversely.
3. Cells from the third tumor, fresh specimen; *a*, stellate cell with numerous nuclei; *b*, spindle-cells with one long nucleus; at *c* the ends of the spindle fatty; *d*, spindle-cells, with several nuclei; *e*, fatty débris with free nuclei, partly fatty.
4. Striated spindle-cell from the first tumor.
5. Muscle-fibres from a five to six weeks' old embryo.

which we have been obliged to use the obstetric forceps, and in nulliparæ split the perineum before we could extract the polypus (Fig. 268). With the exception of the greater muscular effort required, and therefore pain experienced in the expulsion of these large tumors, they do not cause very much more bleeding than the smaller ones.

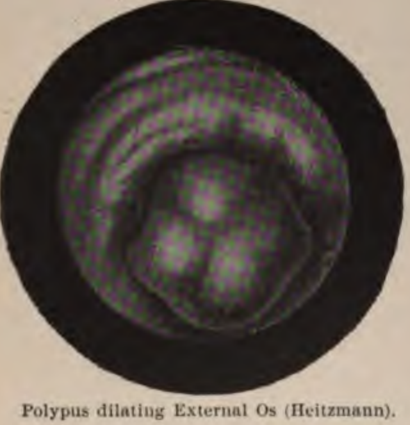
Symptoms.—The chief symptom produced by a fibrous polypus of the uterus is hemorrhage, not only during the menstrual period, but at any other time. If the polypus is still situated within the uterine cavity, and is exciting that organ to efforts of expulsion, there will be in addition severe labor-like pains which, to women who have borne children, recall the contractions experienced during childbirth. These pains are more frequent at the time of the approaching menstrual period, and of course their severity is in proportion to the size of the tumor and to the strength of the efforts required by the uterus to expel it.

Fig. 265.



Complete Laceration of Perineum caused by Extraction of Large Uterine Polypus with Obstetric Forceps. The laceration was at once sewed, and healed readily. Patient was a virgin 41 years of age. Polypus size of fœtal head. (From a case of Mundé.)

Fig. 264.



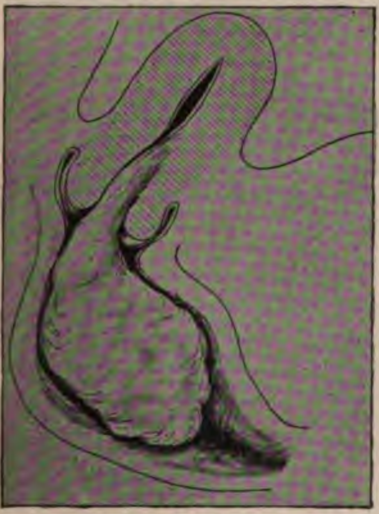
Polypus dilating External Os (Heitzmann).

Pains in the lower part of the abdomen and back, bearing down, a feeling of weakness, and want of support in the pelvis are symptoms which will naturally accompany these tumors. The bleeding is very often so severe in these cases that the women become bedridden and utterly exsanguinated, although death seldom occurs from the hemorrhage, the lulls between the attacks being usually sufficient to enable the patients to recover strength and blood enough to resist the next attack.

Physical Signs.—Examination by the finger reveals decidedly different conditions, according as to whether the tumor is still situated in the uterine cavity or has already entered the cervical canal and is dilating the external os, or whether it has escaped into the vaginal canal.

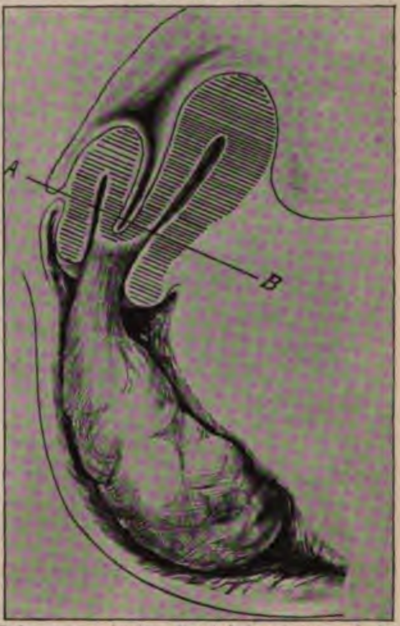
If still situated within the uterine cavity, the external orifice may be only sufficiently wide to allow the insertion of the index finger up to or through the internal os, or the diagnosis may have to be made by the uterine sound, which on passing through the internal os first meets an obstruction, and then, on its direction being slightly changed, passes over that obstruction until it reaches the fundus. The cavity of the uterus, it must be remembered, is always elongated in these cases. If the tumor has already dilated the external os, the diagnosis is of course very easily made by the examining finger, and the more so if the mass has escaped into the vagina. The point of attachment of the polypus is not always easy to determine unless the finger can be passed into the uterine cavity.

FIG. 266.



Polypus filling Vagina.

FIG. 267.

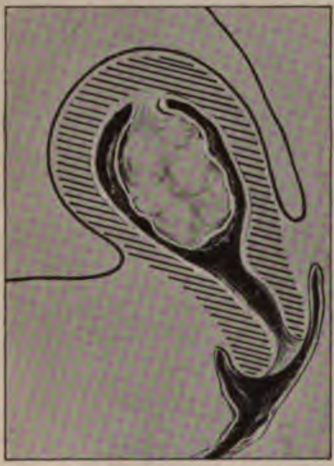


Polypus producing Partial Inversion of the Uterus. *A-B* shows level of inverted peritoneum.

Differential Diagnosis.—In order to make a correct diagnosis of an intra-uterine polypus, the uterine canal, if not sufficiently dilated for the introduction of the finger, must be rendered accessible to it by means of tupelo tents, aided, if necessary, by the bilateral division of the vaginal portion of the cervix and the internal os. If the polypus has escaped into the vagina and its pedicle more or less fills the cervical canal, it may so closely simulate an inversion of the uterus, especially if the pedicle has become attached to the adjacent walls of the canal, that the true diagnosis may become exceedingly difficult. This is the more the case if, as very frequently happens, the expulsion of the tumor has caused a partial inversion of that part of the uterine wall to which it is attached. The introduction of the sound into the uterine cavity, careful bimanual examination under anæsthesia with reference to ascertaining the location of the body of the uterus, and the absence of pain or inflammatory reaction following a protracted examination in case of a polypus, as against the possible presence of these consequences in case of inversion, will usually prevent the practitioner from making a mistake.

Course and Termination.—Fibrous polypi will usually remain where they are until removed. Occasionally the forcible contraction of the uterus will cause the sloughing of the tumor or the detachment of the pedicle, and the mass may then gradually work its way out or be expelled from the vagina by the contractions of that canal. At times the tumor, if attached to the fundus uteri, may be expelled, inverting during that process the whole uterus in consequence of the traction on the point of attachment.

FIG. 268.



Fibrous Polypus attached to Fundus Uteri. Suitable case for avulsion with Goodell's long forceps.

Prognosis.—This is always good, since, as we have already mentioned in regard to glandular polypi, once discovered, their removal is usually easy and the recovery rapid. Only in cases where the polypus is attached to the fundus is the preparatory treatment required to bring the tumor within reach for removal tedious, painful, and to a certain extent dangerous.

Treatment.—The old division of treatment into palliative and curative is no longer tenable or practised. A polypus of the uterus, once discovered, should be removed as soon as it can safely be done. As already mentioned under Fibroids when speaking of the submucous variety, the one essential factor is sufficient dilatation of the uterine canal to permit the easy accessibility of the tumor to the fingers and the instruments necessary for its detachment. As a rule, Nature prepares the way very satisfactorily for the easy removal of uterine polypi by forcing them down into and through the cervical canal, so that their pedicles can be reached without great difficulty. In former days complicated and dangerous instruments were devised and employed for the purpose of dividing the pedicle of the polypus within the uterine cavity, either by a knife (polypotome), or by a wire rope or steel chain (constricteur or écraseur) passed around the pedicle, or the galvano-cautery wire was employed for the same purpose. Nowadays we have abandoned these complicated and unnecessary contrivances, finding that we can remove any polypus, after thorough dilatation of the uterine canal, by seizing it with vulsella forceps and drawing it into or even out of the vagina until its pedicle is easily reached. This can either then be cut shortly off and the uterus replaced, or, what is far more safe and what we most decidedly recommend, is to seek the line of demarcation between the tissue of the tumor and the uterine wall, and with the finger, scalpel handle, or blunt closed scissors effect a superficial separation between uterus and tumor, and complete the detachment with the fingers. In this way we will avoid doing what has happened to most excellent operators—namely, the removal of a portion of the uterine wall, even to the extent of injuring its peritoneal covering. (See Fig. 267.) Whatever inversion of the uterine body has taken place during the removal of the polypus should then be at once replaced. The uterine cavity should then be irrigated with a 1 : 10,000 solution of bichloride, carefully dried, and packed lightly with iodoform gauze. This latter precaution is not necessary except in cases where the polypus sprang from a point high up in the uterine cavity. When the point of insertion of the polypus was in the cervical canal, a mere tamponade of the vagina with iodoform gauze suffices. The uterus itself provides against hemorrhage by an immediate and thorough contraction of its walls; hence the hemostatic means of removal of polypi above mentioned, as well as the employment of hemostatic pressure after the operation, are not required. It is merely as a matter of precaution in case we are obliged to leave the patient that the tamponade with iodoform gauze is recommended.

The preparation of the uterine canal in order to render the polypus accessible may require some time. We have been obliged to dilate with tupelo tents a dozen times or more, divide bilaterally the cervical canal, and administer ergot during a period of nearly two months before we could finally reach the tumor with vulsella and grasp it sufficiently firmly to draw it through the external os. It is better in such difficult cases, where the polypus springs from the upper portion of the uterine cavity, to be patient and gradually prepare the canal as indicated, rather than to attempt to force the removal of the tumor at the risk of injuring the uterus or producing a perhaps fatal peritonitis or septicæmia. The patient need not lose strength in consequence of this protracted preparatory treatment, since all hemorrhage can be thoroughly controlled by steady tamponade of the vagina or even uterine cavity with iodoform gauze, repeated every three or four days as occasion may require. The piecemeal removal of fibrous polypi is scarcely necessary except where the tumor is so large that it cannot be removed entire. We have never met with a polypus of such size, since tumors requiring mutilation before they can be extracted seldom become polypoid.

Fibroid polypi never undergo malignant degeneration.

Before concluding this chapter we would again emphasize the advice given as regards the invariable employment of the practice of enucleating the tumor after careful incision of its capsule near the point of attachment to the uterine wall, instead of blindly cutting it off at the apparently most favorable point with a knife or scissors. We ourselves have several times narrowly escaped committing a blunder of this kind which we should have greatly deplored, and we have seen several instances in the hands of most expert colleagues where only repeated examinations at different intervals and the final adoption of this method of enucleation saved the operators from both an error in diagnosis (inversion) and from injuring the uterine wall. A uterine polypus once thoroughly removed never returns; a second tumor in the same case may appear at some later period, and is simply a new fibroid which has worked its way down into the uterine cavity, not the return of the one which was removed. It is well to make this point clear to patients, for fear of their blaming us with having performed an incomplete operation when they find that a new polypus has developed.

CHAPTER XXXVIII.

ADENOMA AND SARCOMA OF THE UTERUS.

Adenoma.

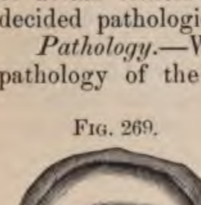
Definition.—By adenoma of the mucous membrane lining the cavity of the uterus is meant hypertrophy of the glands normally found in different parts of that cavity, with or without an increase of their fluid secretions. The various elements of the glands—superficial and lining epithelia and stroma—may all be more or less hypertrophied, and accordingly there may be either a diffuse enlargement of the mucous membrane or of its individual portions.

Varieties: Adenoma of the Cervix.—This has already been described under the head of Glandular Polypi in the preceding chapter, to which we refer.

Adenoma of the Body.—In the cavity of the body of the uterus the adenomatous degeneration may manifest itself either in the form of a minute enlargement of the numerous glands or in the production of actual tumors which dilate the cavity of the organ and produce decided pathological symptoms.

Pathology.—We confine ourselves entirely to the description of the pathology of the adenomatous degenerations above the internal os, those below that point having been described in the previous chapter. The most common form of this disease is the hypertrophy of a certain number of the uterine glands, varying from a few scattered here and there throughout the cavity to such a quantity as to completely occlude the passage. (See Figs. 153 and 260.)

FIG. 269.



Adenoma of Cervix (Winckel).

This hypertrophy may be confined to only a certain number of glands, or it may extend throughout the whole tissue of the mucous membrane of the uterus, being then called diffuse adenoma of the endometrium. When but a certain number of glands are enlarged and projecting into the uterine cavity in the shape of small polypoid tumors varying from the size of a small shot to a canary-seed, the condition is spoken of as polypoid degeneration, villous or hemorrhagic endometritis, or, very commonly in this country, granulations of the uterine mucous membrane. This is the most common form, and the one which we are usually called upon to treat as a cause of profuse menstruation. It is not malignant in character, and while after the removal of the hypertrophied glands, if the action of the mucous membrane is not kept under proper control, they may return once or oftener, they almost always remain benign, and the prognosis is correspondingly good.[1]

At times the hypertrophy of the mucous glands of the uterine cavity proper becomes excessive; a number of glands combine and develop into actual tumors which may attain the size of a bean or even larger. They usually occur in women advanced in life, and are very liable to undergo a sarcomatous degeneration, which of course renders their removal a merely temporary cure. It is therefore advisable in all cases of diffuse adenoma of the body of the uterus to subject the specimens removed to a microscopical examination, and to decide upon prognosis and treatment accordingly.

Causes.—Any persistent hyperæmia or irritation of the mucous membrane of the uterine cavity will tend to produce the glandular enlargements here described. Thus chronic endometritis, subinvolution, hyperplasia, displacements, laceration of the cervix (a very common primary factor in the production of villous endometritis), finally, possibly, gonorrhœal infection,—may all exert a powerful influence in stimulating the uterine glands to the hyperplastic development.

Symptoms.—The first symptom is an excess of the normal secretion from the uterine cavity; the next, a change in the secretion from a serous, non-irritant discharge to one that irritates and erodes the parts over which it passes; and the third and final, the production of profuse menstruation. These symptoms are not confined by any means to women who have borne children, but may be found as the result of this disease in virgins or nulliparous women, and even in women who have already passed the change of life. The chief symptom undoubtedly is the profuse menstrual flow for which most patients seek medical advice.

Differential Diagnosis.—The diagnosis is easily made in the case of villous endometritis by passing a small wire curette into the uterine cavity (as already fully described under the heading of Endometritis, to which chapter we refer for further particulars). The absence of any other sign than the mere anæmia following the profuse menstruation will usually enable us to eliminate the probability of malignant disease of the endometrium, but when we find the uterine cavity occupied by actual tumors which cannot be removed by the small blunt curette, and which on dilating the canal with tupelo tents and introducing the finger present a suspiciously soft touch, it is always best to subject a portion of the specimens removed to the microscope, since masses of this kind are very apt to degenerate into the other form of intra-uterine disease about to be mentioned in this chapter—namely, sarcoma.

Prognosis.—While diffuse polypoid adenoma of the small variety (villous endometritis) may recur once or more times, and still not be malignant, when tumors of the larger variety return the prognosis is usually unfavorable, because their malignancy then remains long in doubt.

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[1] See Fig. 153.

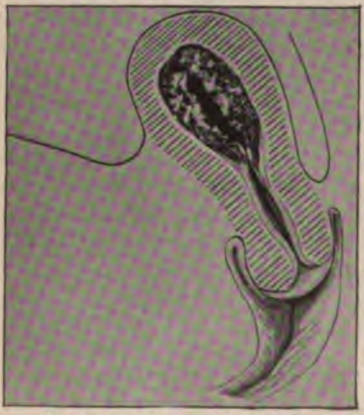
Frequency.—Villous endometritis, as already stated, is exceedingly frequent. Diffuse papillary adenoma of the body, with the development of larger tumors is, however, fortunately comparatively rare. We say "fortunately," because, as we have already mentioned, such tumors are very liable to become malignant.

Treatment.—The same treatment applies to both the minor and the major varieties of this disease—namely, the complete, thorough, and permanent removal of the pathological growths. This is effected, in the variety known as polypoid or villous endometritis, by means of the blunt, or in bad cases the sharp, curette, with the immediate application of strong tincture of iodine or iodized phenol. In larger growths, however, the curette, even of the sharp variety, will usually not suffice, and the uterine cavity requires to be thoroughly dilated by tents and the growths to be removed by the galvano-cautery loop or by twisting off with forceps (see *Morcellement*, under Fibroids), followed by the sharp curette and the thorough swabbing of the uterine cavity with strong nitric acid. It is but necessary to mention that the causes of the formation of these growths already referred to should never be neglected, since upon their removal depends the permanent cure of the disease.

Sarcoma.

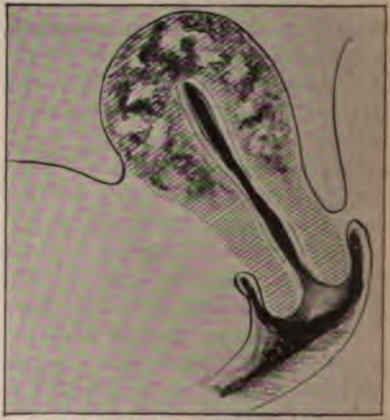
History.—For a number of years there were found scattered through medical literature descriptions of a tumor growing from the cavity of the uterus which for a time simulated true myo-fibroma, and then gradually developed more or less pronounced malignant traits. Such tumors, after their removal as apparently perfectly benign fibrous growths, returned again and again, and finally terminated fatally. Besides, contrary to the usual course of fibroids, they showed a tendency to break down, bleed, become gangrenous, and produce septic infection. The older authors, Paget, West, Oldham, and others, called such growths

FIG. 270.



Sarcoma of Mucous Membrane of Body of Uterus.

FIG. 271.



Sarcoma of Stroma of Body of Uterus.

malignant fibrous tumors, recurrent fibroids, and myeloid tumors. Virchow was the first to give the name of sarcoma—derived from the Greek σάρξ, flesh—to these growths, and to clearly define the disease and place it in a distinct class, apart both from the non-malignant fibroids and the rapidly malignant cancerous developments.

Definition, Pathology, and Frequency.—Sarcoma, according to Virchow, distinguishes itself by a rapid growth of connective tissue, characterized chiefly by the predominant development of cellular elements. The various component parts of the growth possess the characters of incomplete, rudimental, or embryonic development, and not those of perfect tissue microscopically. There are scattered throughout the stroma of connective tissue accumulations of cells with large nuclei, some of the cells being long, others spindle-shaped, and, according to the predominance of the one or other of these cells in a tumor, it is called either a round-celled or a spindle-celled sarcoma. The difference between sarcoma and carcinoma is that in sarcoma the cells are mixed indiscriminately with the connective tissue or stroma, not being congregated in masses at any one spot, whereas in carcinoma the arrangement of the cells is in accumulations or nests surrounded by the connective tissue. As a result of this microscopical arrangement the sarcoma grows more slowly, becomes less easily disintegrated and broken down, and therefore reaches a fatal termination at a much later date than does the carcinoma. Sarcoma is not often found in the cervix uteri; starting, when it does occur there, usually in the stroma of that part. In this respect it differs from cancer of the cervix, which is very much more common than cancer of the body of the uterus, and usually starts in the mucous membrane. On the other hand, sarcoma of the body of the uterus more frequently commences in the mucous membrane than in the stroma of the organ. There are very many subdivisions of sarcoma which apply as well to other portions of the body as to the uterus. In a general way, sarcoma may be divided into soft and hard, according to Virchow, who gives as other subdivisions a fibro-sarcoma, a myxo-sarcoma, a glio-sarcoma, a melano-sarcoma, a chondro-sarcoma, and an osteo-sarcoma. Of these varieties, only the fibro-sarcoma, myxo-sarcoma, and possibly melano-sarcoma, concern us, and these are not confined to the uterus, but are found in various pelvic organs, from the vulva inward.

Sarcoma of the uterus is by no means as frequent as carcinoma. Precise figures it is not in our power to give.

Causes.—These are as uncertain and doubtful as those usually given for carcinoma; possibly the retention of placental fragments following an abortion may be the starting-point of the malignant degeneration, or the disease may gradually develop from a hyperplastic villous endometritis; but, as in carcinoma, there must probably be some as yet mysterious and unknown constitutional predisposition which in some cases causes a malignant development under circumstances which in the other cases would speedily terminate in recovery.

Symptoms.—The symptoms of sarcoma of the uterus are—first, a watery, then sero-sanguineous, and finally bloody, discharge which gradually becomes offensive, is mixed with more or less detritus or tissue-shreds, and in course of time produces a marked debility of the patient. Severe pain is usually experienced in the suprapubic region when the disease is pretty well advanced. While at first the sanious and even bloody discharge has not attracted any particular attention, the deterioration of the patient's general health at last causes her to seek professional advice.

Physical Signs.—If the disease is situated at the cervix or within the cervical cavity, the examining finger easily makes the diagnosis of a nodular, readily-bleeding enlargement of that part. The microscope will settle the diagnosis; but, unfortunately, as already mentioned, the disease is usually limited to the body of the uterus, and only after dilatation of the canal and the passage of the finger into the uterine cavity can a presumptive diagnosis be made. The finger will detect in the cavity of the uterus a mass of spongy, more or less friable, readily-bleeding tissue springing diffusely from the uterine wall, on removal of which by means of the finger or the curette the microscope makes the diagnosis. The uterine body is more or less enlarged in proportion to the amount of diseased growth contained in its cavity. Occasionally the mucous membrane is found perfectly smooth and unaffected, but the body of the uterus is enlarged, and at one point or the other a tumor is felt within the uterine wall, which has ulcerated internally, and from which the discharge emanates. The disease is then not one of the uterine mucous membrane, but of the uterine muscular tissue. In rare instances the whole uterus appears to be infiltrated with sarcomatous nodules.

Differentiation.—In the early stages the disease may be mistaken for retained placental fragments, for a uterine polypus, or, if of the interstitial variety, for a fibroid. Later on it may simulate a sloughing fibroid, but the one disease with which it may be most readily confounded is true cancer of the mucous membrane or body of the uterus.

Course, Duration, and Termination.—As a rule, sarcoma runs a much slower course than carcinoma, but its termination is none the less fatal. Sarcoma is not only more slow in its original development, but it is also less prone to recur rapidly and perniciously than carcinoma. Thus a sarcoma of the body may be removed by the curette and caustics, and apparently cured over and over again, before it finally perforates that organ or by constitutional cachexia proves fatal. This latter termination may under appropriate treatment be deferred in favorable cases for from five to six years, the average duration of cancer being scarcely two years after it has first been discovered; still, this comparison should be received with some hesitation, since sarcoma occasionally terminates fatally with great rapidity, and carcinoma again at times runs a very slow and latent course. As in carcinoma, the patient gradually sinks under the morbid influences of hemorrhage, septicæmia, spread of the disease to neighboring viscera, metastasis to distant organs, disturbances of nutrition, or peritonitis.

Prognosis.—This is, of course, invariably unfavorable unless the disease, as indeed is the case with true cancer, is discovered at so early a stage that the whole of the diseased tissue, even though it may involve the entire uterus, can be safely and completely removed. The harder the tissue of the neoplasm, the more slowly it grows; the softer —that is, the more infiltrated with cellular elements—the more rapidly it increases, and therefore the less favorable the prognosis.

Treatment.—As soon as the diagnosis has been made the treatment consists in as thorough a removal as possible of the diseased tissues down to the underlying or adjacent healthy structures.

In the case of the cervix this may be effected with the knife, scissors, galvano-cautery wire, Paquelin's thermo-cautery, or strong caustics, preferably chloride of zinc, and in favorable cases of this location of the disease a complete cure is undoubtedly possible. When the disease is situated in the uterine cavity, the palliative treatment consists in scraping away the sarcomatous tissues with the sharp curette, and applying either the chloride of zinc in a 50 per cent. solution, or the persulphate of iron equal parts with glycerin, or a strong tincture of iodine; but, as indicated, such treatment is merely palliative, and care should be taken that in endeavoring to relieve the patient of her hemorrhages and the profuse wasting discharge perforation of the uterine wall by the curette or the caustics is not accidentally produced. Spiegelberg reports two such perforations with the curette, and Sims and others mention a similar accident as the result of caustics applied to the uterine cavity. The only radical means of cure of sarcoma of the body of the uterus is the complete extirpation of the diseased organ. Attempts have been made to effect this purpose by removing the supravaginal portion of the uterus through an abdominal section, and some successful results have been thus achieved; but unquestionably the ideal indication for the operation of the complete removal of the uterus by means of the vaginal method is given by precisely these cases of sarcoma and carcinoma limited to the body of the uterus. If undertaken sufficiently early before any possibility exists that the para-uterine tissues are involved, a complete and permanent cure must certainly result.

SARCOMA OF THE PELVIC CELLULAR TISSUE.—While not coming under this precise heading, we have thought it worth while to include under Sarcoma the mention of a sarcomatous degeneration of the cellular tissue of the pelvis of which we have seen several instances. A large tumor presented itself to us in two cases, situated behind the cervix and pushing the uterus forward, which simulated a pelvic hematoma or an effusion of some kind into the pelvic cellular tissue. The cachectic appearance of the patients led us to suspect something more serious than a mere effusion of blood. On opening the tumors *per vaginam* we evacuated a large quantity of broken-down coagula intermixed with flesh-like masses, and on introducing the finger we found a large cavity, the walls of which were studded with friable, easily-bleeding excrescences which could be readily removed by the finger and a Sims depressor used as a curette. Under the microscope these masses presented the unquestionable appearances of round-celled sarcoma. The extra-peritoneal location of these cavities could not be doubted. Both patients succumbed to the usual symptoms indicative of malignant disease, and the post-mortems verified the diagnosis.

CHAPTER XXXIX.

CANCER OF THE UTERUS.

Definition.—Between cancer of the uterus and the same affection in other parts of the system there are no marked differences. As in other organs, it may be defined as a disease which is characterized by great proliferation of connective tissue, excessive generation of cells of epithelial type, and marked tendency to extension to neighboring parts, to molecular death, and to return after removal. Waldeyer[1] concisely defines cancer as "an atypical epithelial neoplasm."

History.—Becquerel asserts that, "in spite of its great frequency, cancer of the uterus is not a disease of which the history has been long known." That it was not understood as we understand it to-day is most true, but the ancients surely had a certain degree of knowledge concerning its clinical features. Hippocrates—*De Morbis Mulierum*—describes it at length, declaring it to be incurable. Archigenes wrote a chapter upon it, describing the ulcerated and non-ulcerated forms and the peculiarities of the discharges. His article is preserved by Aëtius, who entitles it "De Cancris Uteri," and is copied verbatim by Paul of Ægina without the slightest acknowledgment. The Arabians likewise were familiar with it,.Alsaharavius, Haly Abbas, and Rhazes all alluding to its prognosis and treatment in a manner which leads us to believe that they understood its true nature.

Upon the revival of gynecology in France the disease was confounded with fibrous tumors and areolar hyperplasia. Astruc described "scirrhus" in 1766 as the result of abortion, and the confusion which attached to his description extended long after him. It characterized the times of Récamier and Lisfranc, and even so late as our own period we see the view endorsed by Ashwell, Montgomery, Duparcque, and many others. Blatin and Nivet,[2] in expressing their belief that scirrhus results from chronic inflammation of the parenchyma, append the following footnote: "Paul of Ægina, Galen, Andral, Broussais, Breschet and Ferrus, Piorry, Bouillaud, etc. place scirrhus among the terminations of chronic inflammation; some of them, however, admit the existence of a predisposition."

While the physicians of ancient times show that they knew of the existence of this disease, they have done very little to aid us in understanding its true nature. Within quite recent years this uncertainty has been increased by the addition of certain confusing terms which only deferred the understanding of the true character of cancer, and led to mystifications which at the present day, under the influence of recent microscopical investigations, seem entirely inexcusable. Thus we find in books of not very remote date descriptions of an affection called "rodent ulcer" or "cancroid" or "cockscomb granulations"

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[1] Billroth, *Surg. Pathol.*, Am. ed.

[2] *Mal. des Femmes*, Paris, 1842.

(John Clark, Sir Charles Mansfield Clark, Ashwell, Churchill), which to our present understanding indicate with absolute clearness true cancer of the epitheliomatous variety. Such descriptions were of course limited to the cervix uteri. The "rodent ulcer," the "cancroid," the "lupus," the "malignant ulcer" described by these and other authorities were nothing but epithelioma of the cervix. It is to a correct understanding of the microscopical elements of the tissues involved and of the clinical course of these affections that we now owe the possibility of an easy diagnosis of these cases. Even the rare forms of hard cancer of the cervix known as scirrhus, which formerly were looked upon as merely a hyperplasia or sclerosis of that part, are now recognizable by our improved methods of examination.

Pathology.—Although in former years, and perhaps in some quarters still at the present day, there may be a difference of opinion as to whether cancer of a single organ is the result of a pathological change in that organ or of a peculiar constitutional taint which manifests itself locally, the general opinion at present is that cancer is a local disease, beginning in the organ where it first shows itself, and then either remaining local and terminating fatally through its communication to neighboring organs or through a contamination of the whole system. This means that if discovered at a sufficiently early stage cancer may be entirely cured by removal of all diseased tissue. Manifestly, if the original and primary cause of the cancer consisted of a constitutional taint, the local extirpation of the diseased parts would not cure the disease permanently. But the result of numerous operations proves that the proposition first laid down is the true one, and we confidently believe that so long as the tissues surrounding the diseased part are not involved macroscopically or microscopically in the morbid process, a complete extirpation of the cancerous mass will unquestionably effect a permanent cure. We are therefore firm believers in the local origin and nature of this disease so long as it remains confined to the organ originally affected. The question of constitutional predisposition is as yet *sub judice*, and we do not pretend to deliver a positive opinion on that point. In all probability, basing upon researches by Waldeyer, Thiersch, Koester, Billroth, Klob, and others, cancer originally begins in the epithelial linings of the lymphatic glands, and thence spreads more or less insidiously to the neighboring parts.

If the cervix uteri has been first affected, the disease spreads from this point, invades the whole neck and sometimes the body of the uterus, the ovaries, vagina, bladder, and intermediate tissue. Even the bones of the pelvis may be attacked. For a varying length of time the deposition goes on; then without assignable cause the lowly-organized mass begins to die and ulceration or molecular death occurs. The detritus gives rise to a fetid, ichorous, and bloody discharge, which excoriates the vulva and thighs, and renders the patient disagreeable to herself and all around her.

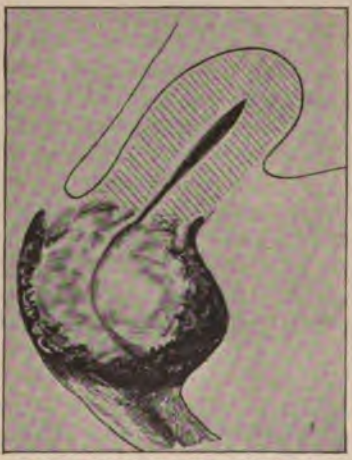
The disease extends to neighboring and distant organs by several methods: first, by continuous growth; second, by absorption of contagious fluid or cell-elements from the cancer by the lymphatics and transmission to the glands and other parts; and third, by venous absorption.

Varieties.[1]—Cancer may attack the uterus in any one of the following forms:

1st. Epithelioma; superficial or epithelial cancer;
2d. Encephaloid or soft cancer;
3d. Scirrhus; fibrous or hard cancer.

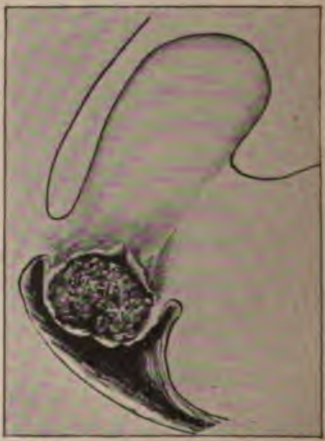
1. Epithelioma, Superficial or Epithelial Cancer.—This variety usually affects the lining membrane of the cervical canal and the lips and adjacent parts of the vaginal portion of the cervix. It consists in an infiltration of the tissue of the cervix with numerous epithelial cells arranged in nests or shoots, so called trabeculæ, together with an hypertrophy of the normal papillæ of the cervix. There are two varieties—namely, that in which the hypertrophy of the papillæ predominates, the interstices between the hypertrophied papillæ being occupied by these accumulations of epithelial cells arranged in regular clusters and shafts. This peculiar arrangement of epithelial cells enclosed in connective tissue is the characteristic of this form of cancer. The development of the papillæ in this variety may be so great as to form a tumor sprouting from one or both of the lips of the cervix and occupying the vagina even down to its orifice. The tumor may attain the size of a large orange, or even on rare occasions of a fœtal head, so as to prevent the examining fingers from reaching its attachments to the cervix. This is the variety known as cauliflower growth (Fig. 272), from its similarity to the head of the well-known vegetable of that name. The vaginal walls may become infected by a direct spread of the disease or by infection at some point in the lower part of the canal.

Fig. 272.



Proliferating Epithelioma of Cervix (cauliflower growth).

Fig. 273.



Flat Epithelioma of Cervix.

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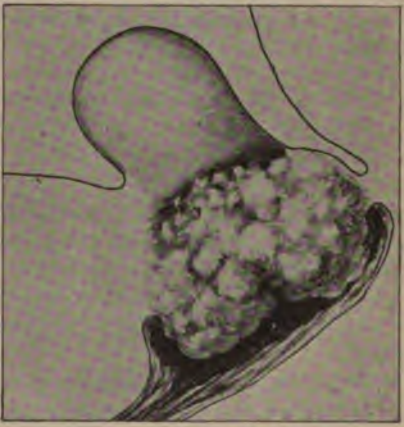
[1] Although, to be systematic, we have deemed it best to adopt these conventional terms, the student must not imagine that it is always an easy matter to classify a uterine cancer under one of them. Very commonly a growth will be met with which occupies a middle ground between these varieties, and is neither pure scirrhus, encephaloid, nor yet epithelioma.

The second variety is likewise characterized by the infiltration of the superficial tissues of the cervix with the cellular elements occurring in the first variety, but the hypertrophy of the papillæ is absent, and the disease therefore presents merely an abraded, usually somewhat excavated appearance, extending up into the cervical canal, associated with more or less enlargement of the intravaginal portion of the cervix. It is this form which was undoubtedly mistaken in previous years for rodent ulcer or cancroid.

This epithelial variety commonly extends up the cervical canal into the uterine cavity if the disease has existed for any length of time.

2. Encephaloid.—This form of cancer of the cervix is characterized by diffuse infiltration of cells—not of the epithelial variety necessarily, but of round, spindle, and caudate cells, not usually found in these parts, together with a proliferation, but of a lesser degree than the cell-development, both of which together produce a decided enlargement of the cervix, chiefly of that part of it which is situated above the vaginal insertion. There is no vaginal tumor, properly speaking, but the normally slender or conoid cervix is enlarged in every diameter, very much like the body of a turnip. The parametria are not involved in the early stages; there is no open surface, therefore no bleeding and no ulceration in this form of the disease (Fig. 274). The feel of the enlarged cervix to the examining finger is more or less soft, somewhat nodular or irregular in outline. In these cases it is often difficult to differentiate between this disease and hyperplasia of the cervix. By gradual extension this form of cancer may also spread to the adjacent parts and to the body of the uterus. This is the next most common variety of cancer of the cervix.

Fig. 274.



Encephaloid of Cervix.

3. Scirrhus.—By the increase of the connective and fibrous elements of the part it is enlarged very similarly to the condition described in the previous form. The difference is that, in contradistinction to the encephaloid, the hyperplasia of the fibrous tissue predominates decidedly over that of the cellular elements. The cervix is not only enlarged, but very hard, dense, almost cartilaginous, and usually extremely nodular to the examining finger. There is no bleeding, no eroded portion, and the suspicion of malignant disease rests entirely upon the irregular nodular enlargement of the cervix, out of proportion to the size of the rest of the uterus. This form of the disease is in our experience the slowest of development, the last to break down, produce hemorrhage and constitutional symptoms.

We are aware that this division of the forms of cancer of the cervix uteri is to a certain extent arbitrary, and that microscopically typical and ideal cases of each variety may not always be easy of demonstration, since when the disease comes under our observation the forms have more or less become merged into each other. The ultimate result clinically of these three varieties is the breaking down, destruction, and sloughing of the diseased part, so that at a certain time in the progress of each one of these varieties it is impossible for the examiner to say in what way the disease originally started.

While, therefore, for theoretical and descriptive purposes it is necessary and desirable to describe the three forms of cancer of the cervix uteri as we have here done, clinically it is often impossible to differentiate between them.

Frequency.—Cancer of the uterus is a very frequent affection, about one-fourth of all fatal cases of this disease being those involving that organ. Gurlt found in 11,140 women with tumors, 1399 benign and 5029 doubtful and malignant genital tumors. Of the latter, 3521 were uterine tumors, and of these 3449 were carcinoma of the uterus and vagina. According to Rokitansky, cancer is found most frequently—first, in the uterus; second, the female breast; third, the stomach; fourth, the large intestine, especially the rectum; fifth, the lymphatic glands, etc.

Of all cases of cancer in females, the uterus is affected in ⅔—Kiwisch.[1]
" 9118 " " " " was " 2996—Tanchou.[2]
" 8746 " " " " " " 3000—Simpson.[3]
" 5122 " " " " " " 113—Wagner.[4]

Statistics prove that cancer is nearly three times more frequent in women than in men, and more than three times more frequently met with in the uterus than in any other organ of the female.

The most frequent variety in our experience is that of epithelioma of the cervix, the next encephaloid, and the third scirrhus of the same part.

Etiology.—Nothing positively certain can be said about the causes of cancer of the uterus, either predisposing or exciting.

Predisposing Causes.—Those predisposing causes which are generally admitted may be thus enumerated:

Hereditary tendency;
Middle or advanced life;
Race, the African enjoying partial immunity;
Repeated parturition;
General depreciation of vital forces.

Among the predisposing causes heredity is supposed to play a very prominent part, but we confess that we are doubtful as to its real value. Some authors state that in proportions varying from 7.6 to 13 per cent. hereditary predisposition is present. Winckel mentions about 6.3 per cent. of such cases from his own experience, but we do not consider these figures to indicate in any degree that cancer of the uterus, any more than cancer of any other organ of the body, is positively hereditary. That the unknown and mysterious taint of cancer may be transmitted, like that of tuberculosis, can perhaps not be denied; but, so far as cancer is concerned, statistics do not seem to clearly bear out this conclusion. Probably the most plausible predisposing cause of cancer of the cervix is a prolonged and frequent irritation of some kind of that organ, such as might be produced by a chronic cervical catarrh, especially if associated with hyperplasia of the glands of that cavity—a cause chiefly existing in virgins and nulliparous women; further, a laceration of the part, together with an eversion, erosion, and papillary hyperplasia. Unquestionably, laceration of the cervix, when inducing and presenting such a pathological degeneration of the injured organ, forms in our experience a certain predisposing factor for malignant degeneration. Cancer of the cervix undoubtedly most frequently occurs in married women, especially in those who have borne children. Winckel states that women with cancer of the womb are very rarely entirely sterile, only 1.7 per cent. instead of 20 per cent. Of the multiparous women afflicted with cancer, the average number of children was 8.2 per cent. An unusual number of abortions and premature deliveries is mentioned also by some authors among the possible causes of this disease. While, therefore, pregnancy and parturition more or less frequently repeated do not show any positive evidence of predisposition to cancer of the uterus, difficult, prolonged, and instrumental labors, especially such as result in an injury to the cervix, decidedly show such a predisposition. Hofmeier found only 4.8 per cent. of nulliparæ in 812 cases of carcinoma; Funk found 69 sterile women in a total of 925 having cancer. According to Schroeder, the proportion of hereditary cases is probably 78 : 948, and prostitutes were not especially liable to uterine cancer.

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[1] Klob, *op cit.*, p. 205.

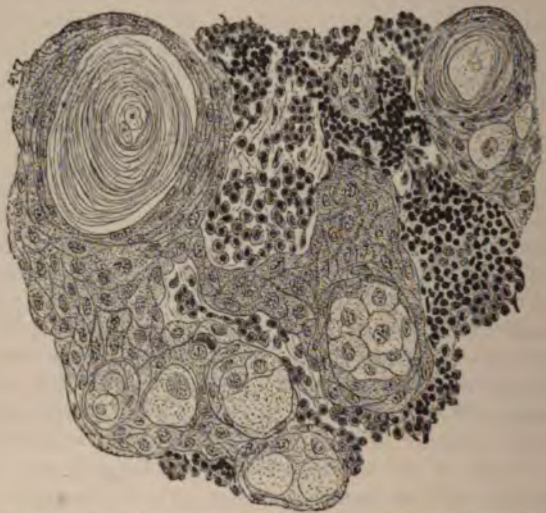
[2] *Rech. sur les Tumeurs du Sein*, p. 218.

[3] *Clin. Lect.*, p. 42.

[4] *New York Med. Journ.*, vol. ix. p. 561.

While some authors state that mental anxiety, sorrow, and trouble may account for the production of some cases of cancer, and thus for the greater frequency of this disease in the poor than in the rich, we think it more likely that the prevailing bad nutrition in the poorer classes, depending partly upon the necessity for greater physical exertion and the want of adequate and proper nourishment, is the real reason for the preponderance of the disease among the poor. Whatever the cause of cancer may be, whether it appears in the uterus or elsewhere, it would seem to begin by the formation of certain poorly-developed, so-called embryological cell-elements, which gradually increase in quantity and size, and when invading the normal tissues of the part more or less change their shape and character. [That cancer does begin by this peculiar formation of embryological elements seems to be proved by a case which I met with in 1884. In October of that year I removed the uterus by vaginal hysterectomy for cancer of the cervix, which had not extended to the parametrium; hence I was able to carry my line of incision well without the range of the diseased tissue, and apparently entirely in normal structure. The microscopical examination of the specimen, made soon after the operation by Dr. Charles Heitzmann, showed at a point corresponding to the seat of the disease peculiar evidences which induced Dr. Heitzmann to write me that at this very point (he not knowing that this was the spot nearest the diseased portion of the cervix) there were certain formations of poorly-developed embryological cells, and that in case the cancer returned it would do so in the cicatrix at this very location within a period probably not longer than a year. After nine months of entire health a small ulceration made its appearance at the very spot indicated by Dr. Heitzmann, and its rapid development showed its cancerous nature.—P. F. M.[1]]

FIG. 275.



Epithelioma, microscopical appearance (Delafield and Prudden).

A curious theory of Cohnheim, which appears not entirely foreign to the theory just expressed by Heitzmann, is that cancer of the uterus originates in irregularities in embryonic life—an excessive proliferation of certain kinds of cells at a very early stage—the only essential to this production being a plentiful vascular supply. Gusserow agreed with this hypothesis of Cohnheim, while Winckel and Schroeder have opposed it for the reason that it is not proved why, if such germs exist in many individuals, they remain dormant in a large proportion and develop into malignant growths in others.

Exciting Causes.—In persons in whom the predisposing causes already mentioned are present it seems not improbable that an active stimulant or irritant applied to a favorable part of the body will incite a rapid production of cells and papillæ with the peculiar characteristics of carcinoma; hence a blow or any other certain traumatism, such as active, frequently-repeated, and impetuous coition, the application of caustics to the part, might possibly be the direct exciting cause of carcinoma of the cervix. Of course this assumption does not account for the development of cancer in the body of the uterus; the organ to which it perhaps applies most forcibly after the uterus is the female breast, which is more frequently subjected to accidental or intentional violence than any other external gland of the body. Of course this supposition is merely a theory and cannot be proved by any reliable statistics.

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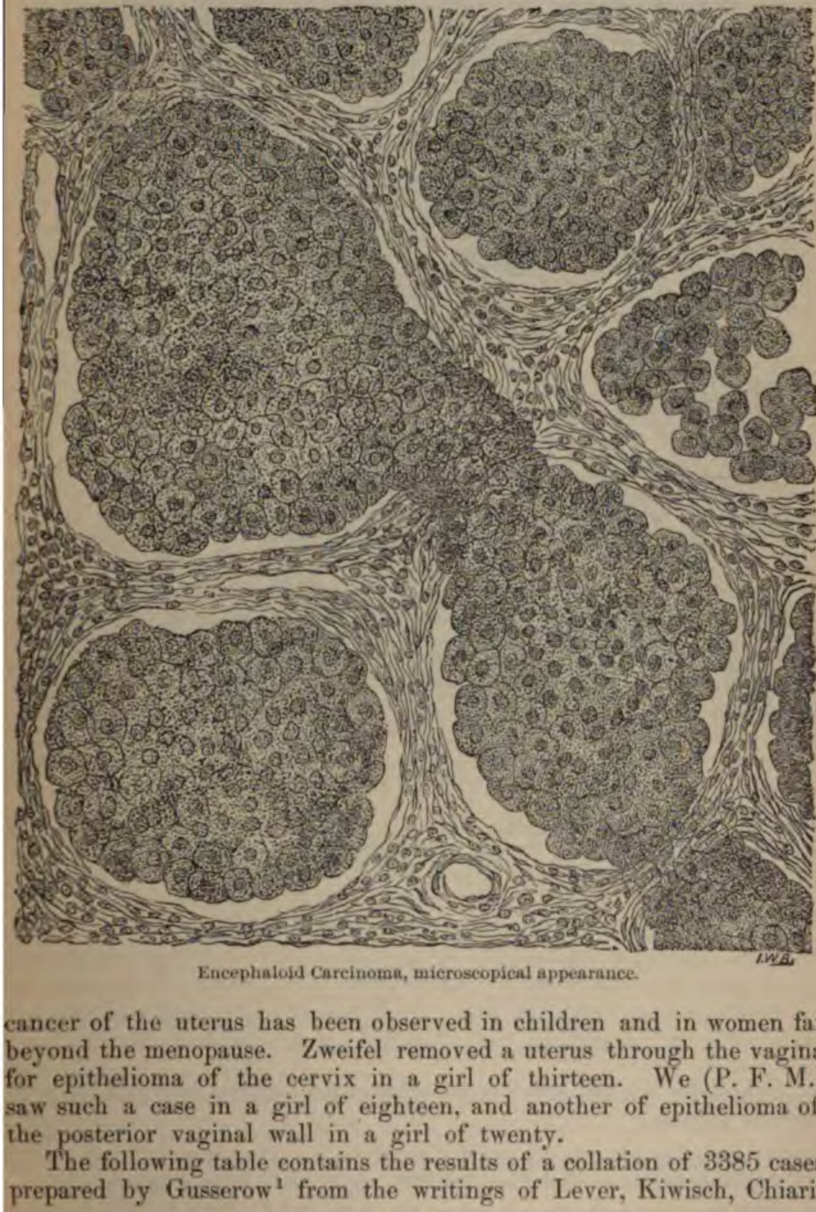
[1] See *American Gynecological Transactions*, 1884.

Age.—The most favorable age is between forty and fifty years, but

FIG. 276.



Encephaloid Carcinoma, microscopical appearance.

cancer of the uterus has been observed in children and in women far beyond the menopause. Zweifel removed a uterus through the vagina for epithelioma of the cervix in a girl of thirteen. We (P. F. M.) saw such a case in a girl of eighteen, and another of epithelioma of the posterior vaginal wall in a girl of twenty.

The following table contains the results of a collation of 3385 cases prepared by Gusserow[1] from the writings of Lever, Kiwisch, Chiari,

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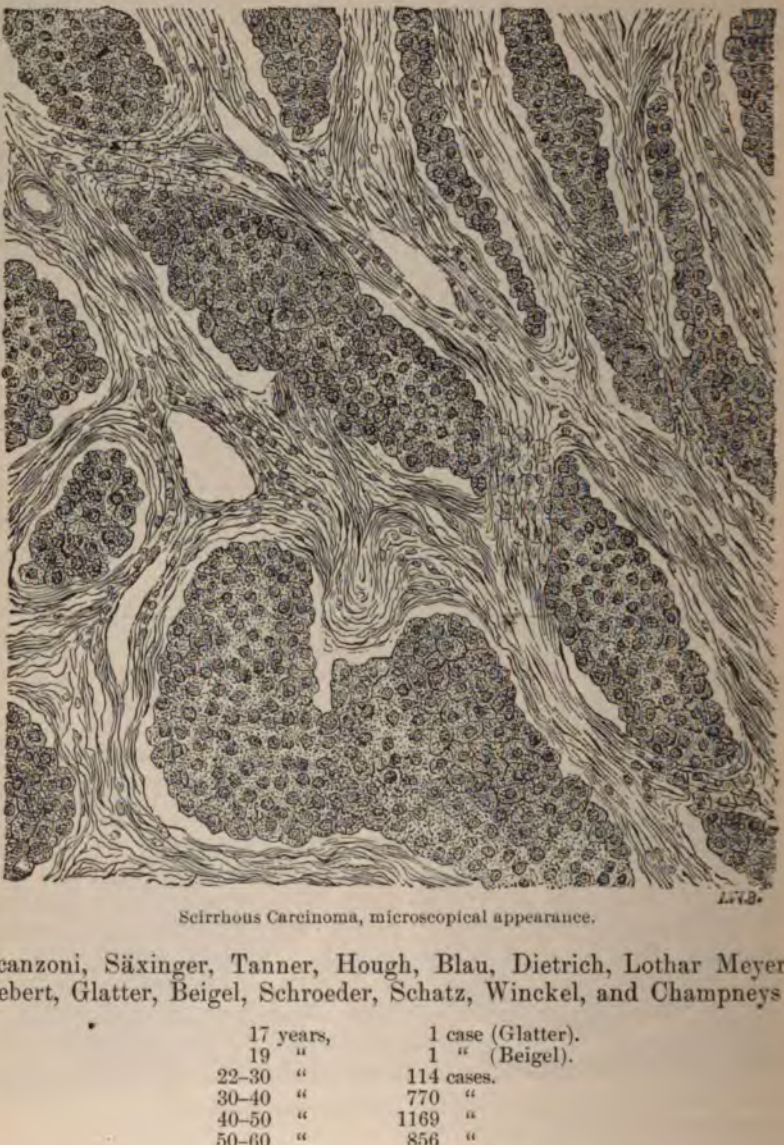
[1] *Die Neubildungen des Uterus*, Stuttgart, 1885.

FIG. 277.



Scirrhous Carcinoma, microscopical appearance.

Scanzoni, Säxinger, Tanner, Hough, Blau, Dietrich, Lothar Meyer, Lebert, Glatter, Beigel, Schroeder, Schatz, Winckel, and Champneys:

17 years,	1 case (Glatter).
19 "	1 " (Beigel).
22–30 "	114 cases.
30–40 "	770 "
40–50 "	1169 "
50–60 "	856 "
60–70 "	340 "
Above 70 "	193 "

Schroeder has published the results of his hospital and private practice, as follows:

Of 14,000 consultations in the hospital, 285 (1.9 per cent.) were for myoma.
Of 16,800 consultations in the hospital, 603 (3.6 per cent.) were for cancer.
Of 9400 consultations in his private practice, $\begin{cases}\text{557 (5.7 per cent.) were for myoma;}\\\text{209 (2.1 per cent.) were for cancer.}\end{cases}$

These figures will prove that myoma is more common in the better classes, and cancer among the poor, thus agreeing with the general opinion on this subject.

Race seems to have something to do with the production of cancer; at least there seems to be less predisposition to this disease in the negro races than in the white—a proportion which is entirely reversed in the case of uterine fibroids, which are far more common among negroes. According to Chisholm, only 1 of 300 negroes of both sexes had cancer, against 1 out of 100 in the white races.

Symptoms.—The disease may pass through its period of inception and make considerable progress toward a fatal issue without developing any symptoms which attract the attention of the patient. Or only slight leucorrhœa and hemorrhage may exist, which may have been passed over as trivial circumstances not deserving investigation or treatment. Usually the following symptoms develop themselves and become more and more prominent as molecular death advances:

Pain through the pelvis;
Tenderness upon movement or coition;
Menorrhagia and metrorrhagia;
Ichorous and fetid leucorrhœa;
Hydrorrhœa;
Dark, grumous discharge;
Constitutional debility;
Pallor and cachectic facies;
Vesico-vaginal or recto-vaginal fistulæ.

Pain and tenderness are not nearly so constant or severe as is often supposed, and they may both be entirely absent.

Menorrhagia and metrorrhagia may exist even before ulceration has occurred, resulting then from congestion of the mucous membrane. But it is not until after the inauguration of the process of destruction that they become alarming or excessive.

Ichorous, watery, and grumous discharges very generally mark the advance of the disease. The first of these discharges produces erythema, erosions, vaginitis, and sometimes[1] a strong sexual appetite. The second exhausts the patient by draughts made upon the serum of the blood. The third creates fetor, and sometimes results in septicæmia, for the material giving color and odor to the flow is a putrilage formed by the detritus from the decaying uterus.

Constitutional debility and cachectic facies are the results, in part, of the malignant toxæmia which is the basis of the disorder, in part of exhaustion produced by loss of blood or some of its elements. Should the walls of the rectum and bladder become implicated, as they very often do, the functions of these viscera are deranged, and the feces or urine, or both, pour out through the vagina, increasing the misery of the patient.

Physical Signs.—Suspicion is generally first aroused and physical exploration prompted by these three symptoms: menorrhagia, fetid discharge, and ichorous leucorrhœa. They belong to the second or ulcerative stage of the affection, and it is almost invariably in this stage that the physician is consulted. Before the occurrence of this stage no symptom usually exists which calls for physical exploration.

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[1] We have never met with this symptom.

[As I have already stated, I have seen but two cases which I am positive were incipient or non-ulcerated scirrhous cancer. In these the diagnosis was made by the peculiarly hard, nodular sensation yielded by the cervix, and in one by the coincident implication of the vagina. —T. G. T.] We feel sure, however, that he who ventures upon a decision as to the nature of the disease at this stage must expose himself to great risk of error. The mere fact of the cervix being excessively hard and nodular is not enough to warrant a diagnosis. This must be accompanied by other reliable signs, as menorrhagia, hydrorrhœa, and constitutional failure, to make a positive conclusion admissible.

For this period of the disease—a period at which diagnosis is of extreme importance in view of the fact that then ablation offers the greatest hope for permanent or temporary relief—Spiegelberg offers a valuable resource in the use of sponge tents. If the induration of the tissue be benign, the dilating influence of the tent will produce a degree of softening, while if it be due to malignant disease the tissue will remain unyielding and hard.

After ulceration has occurred diagnosis, *to an experienced examiner*, is as simple and certain as it is obscure and uncertain before it. The finger discovers an absolute destruction of tissue, and finds the walls of the deep and ragged ulcer producing it covered over with a crumbling, brittle mass, interference with which causes hemorrhage. The uterus is often fixed by secondary inflammation or diffuse deposit of cancerous matter, and the walls of the vagina near the uterine junction participate in the deposit. Sometimes there is a stricture of the rectum, which especially engages the attention of the patient, who suspects no disease of the uterus or vagina.

It is difficult to describe to another the peculiar sensation yielded by an ulcerating cancer, but it is easy to appreciate it by touch. He who carefully explores one case, and notes the hard, unyielding border and brittle surface, with its marked tendency to crumble and produce hemorrhage, will rarely fail to recognize another.

Nevertheless, it is in all cases safe, and in some essential, to remove a small portion of the cancerous material, if it can be done without creating great flow of blood, for examination with the microscope. And now arises the question, What are the microscopic tests of cancer? This subject is one which we cannot leave unnoticed, and yet one with which we must deal as cursorily as is consistent with a concise statement of the existing views of pathologists upon it. This can, we think, most readily be done by a series of propositions:

1st. There is no typical cancer-cell which, separated from its surroundings and viewed as an entity, enables a microscopist to pronounce upon a growth.

2d. There are certain combinations of cells, alveoli, and stroma which do enable a microscopist to pronounce an opinion as to the benignity or malignancy of a growth.

3d. This combination consists, in general terms, in the existence of a fibrous stroma containing ovoid alveolar spaces, filled with masses of cells with large single or multiple nuclei, and all bearing more or less closely a resemblance to epithelium.

Diagnosis and Differentiation.—As a rule, no one who has had the opportunity to examine a fair number of cases of cancer of the cervix would hesitate for a moment in making the diagnosis of a well-marked case of that kind by a simple examination with his finger. *In the early stage of the disease*, before ulceration and destruction of tissue have taken place, the salient points of diagnosis of the three varieties are the following:

EPITHELIOMA—*Papillomatous Variety.*—The vagina is more or less occupied by a soft, cauliflower-like or sponge-like mass which bleeds freely on touch, from which a sero-sanguineous non-odorous fluid exudes, and which appears to spring from one or both lips of the cervix. This mass may be so large as to completely fill the vagina and prevent the examining finger from reaching its point of origin in the cervix. The mass can with very slight force be broken down by the examining finger; there is usually very little pain attending such an examination. The body of the uterus, if it can be felt bimanually, is movable, and the vaginal vault and parametrium are not involved. If the epithelioma springs only from one lip, the external os may be detected and its position verified by the introduction of the sound into the uterine cavity.

Flat or Ulcerating Variety.—This appears as a more or less excavated, freely-bleeding ulceration of the cervix, involving both the vaginal portion of that organ and more or less of the cervical cavity. The vagina and parametrium are usually free and the uterus is movable.

ENCEPHALOID VARIETY.—The cervix presents a swollen, irregularly nodular feel, is enlarged to twice or more its normal size, most of the enlargement being supravaginal and extending toward the parametria. The body of the uterus appears free. The external os is more or less gaping, and usually free bleeding is excited by an attempt to pass the finger into the cervical canal. The feel of the enlarged cervix is rather soft, and considerable pain is experienced on firm touch.

SCIRRHOUS VARIETY.—The cervix is enlarged to double or more its size, nodular, very hard, almost like cartilage, and the induration may extend up into the supravaginal portion. There is no bleeding on examination, and the external os is usually small and its lips rigid. The feel of the cervix is so much harder than that of mere hyperplasia of the organ that an experienced finger very readily suspects the true diagnosis. In the first two varieties the microscopical examination is scarcely ever needed to verify the diagnosis. In the scirrhous form, however, at this stage the microscope may be needed to settle the diagnosis.

In the later stages, after the three varieties of the disease have become more or less merged into each other by increase of cellular elements, and when a destruction of the diseased part has taken place with an actual loss of substance, the diagnosis is even more easy, and no difference can be detected between the three varieties. In place of the cauliflower growth, of the flat bleeding ulcer, of the soft hypertrophied supravaginal portion of the cervix, of the hard cartilaginous cervix, there is now a more or less extensive crater-shaped excavation extending from the vaginal vault up toward the uterine cavity. The intra-vaginal portion of the cervix has in fact entirely disappeared, leaving only an irregular, freely-bleeding, and secreting cavity. The discharge is now not only bloody, but usually exceedingly offensive, having the odor of putrefying and decomposing flesh. The parametria have become involved; there may be a distinct tumor or thickening in the para-uterine tissues. The mobility of the uterus is limited or entirely absent. The vagina may also participate in the degeneration.

For a diagnosis of cancer of the cervix the finger usually suffices; in some cases it is necessary to verify the appearance of the part by the speculum; but he who begins by making a diagnosis of this disease through the speculum shows that he is not conversant with its physical signs. After these remarks it would seem that on theoretical grounds the diagnosis of cancer of the cervix is so simple that few errors would occur in reference to it. This, indeed, ought to be the case, and is really so with all skilful diagnosticians, but still curious errors are occasionally made by the inexperienced, and even those who are well versed may at times be led astray. The conditions with which cancer of the uterus may possibly be confounded are:

Eversion of cervix from laceration;
Papillary hypertrophy of the cervix ("cock'scomb ulcer");
Sloughing fibrous polypus;
Uterine fibroids;
Syphilitic ulcer;
Areolar hyperplasia of cervix with metrorrhagia;
Sarcoma of the uterus;
Retention of products of conception.

From these a differentiation should be arrived at by careful study of the progress of the case, by the degree of constitutional implication, by the results of microscopic examination, and by the development of a tendency to return after removal. A positive conclusion is not always easy, or, without delay, even practicable. An intelligent decision of the question must depend upon care in investigation, thoroughness of examination, and upon time, which in most cases will clear up all doubt. It should be remembered that the diagnostician, however skilful he may be, who bases an opinion upon the sensation of hardness and resistance in the cervix is running a great risk of error. Let it be borne in mind, too, that syphilitic ulcers have been known to eat into the bladder and rectum, and create very much such a state of things in the vagina as carcinoma develops.

Prognosis, Duration, and Course.—The prognosis is pre-eminently unfavorable. Not only is it so from the fact that the disorder is cancerous, but because that form which often affects the uterus belongs to the most rapid and dangerous of its varieties.

In some cases death will ensue in from three to six months, while in others it may not occur for five, six, or seven years. The prognosis should be governed in great degree by the character of the initial affection: true carcinoma, which begins with profound implication of subjacent parenchyma, runs a more rapid course than epithelioma, which often involves only superficial portions of it. The general experience as to the duration of cancer of the uterus may be inferred from the following citation of authorities:

Simpson	gives as an average	2 to 2½ years.
Lebert	" "	about 16 months.
West	" "	about 15 months.
Barker	" "	3 years and 8 months.
Gusserow	" "	12 months.
Lever	" "	20 months.

Seifert gives an average for medullary carcinoma of eighteen months; of epithelial, thirty-six months. Winckel reports that the longest duration observed by him in a recurrent papillary cancroid was three years and eight months. A. Martin records the shortest duration observed by him as nine weeks; the longest, with repeated operations, as five years. Of course the time from which the duration of the disease is dated in these statistics does not mean the actual inception of the morbid process, which must have begun at least some months before the patients came under observation.

The termination of cancer of the uterus, if the disease be uninterfered with, is very generally a fatal one, although it is admitted that there is a *possibility* that the mass may slough away, the surface heal over, and the patient recover. Scanzoni, Rokitansky, Kiwisch, Virchow, and Klob, all announce this fact, strange though it may appear to one who has always taken a more gloomy view. "The cases of spontaneous recovery from uterine cancer," says Rokitansky,[1] "are of extreme rarity, but they do occur." "In opposition to the above phenomena, which inevitably lead to death," says Klob,[2] "the universally acknowledged possibility of spontaneous recovery from uterine cancer is interesting."

Under these circumstances the whole vaginal portion of the cervix usually sloughs off and the os internum becomes the os externum. Instances of spontaneous recovery from true carcinoma are reported by Barker, Habit, and Mettauer, where the sloughing of the uterus followed the application of the acid nitrate of mercury, and the patients remained entirely well. Kiwisch also relates a case of gangrenous sequestration of the entire cancerous uterus. [I have reported a similar case in the *American Journal of Obstetrics* for Aug., 1872, where, after curetting and the application of a solution of perchloride of iron, a peritonitis set in, and all that was left of the uterus sloughed out. The patient was under the care of the late Dr. Alfred Wiltshire of London, at whose request I operated on her, and from whom I heard subsequently that the disease returned in the cicatrix about two months later.—P. F. M.] The cases of Barker, Mettauer, Habit, and Mundé are, so far we know, the only ones reported in which the entire cancerous uterus sloughed away.

When death, which is the almost inevitable issue of cancer, does occur, it is usually due to hemorrhage, septicæmia, uræmia, marasmus, or some one or more of the numerous complications which we now come to enumerate.

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[1] *Op. cit.*, vol. ii. p. 228.

[2] *Op. cit.*, p. 203.

Complications.—The following are the complications which occasionally accompany the disease:

Septicæmia from absorption of putrid fluid;
Cellulitis;
Hydronephrosis;
Peritonitis;
Phlebitis;
Embolism;
Cancer in lymphatic glands or other organs.

In rare cases cancerous degeneration obstructs the ureters and produces in this way uræmic poisoning. The most frequent cause of death, in our experience, is marasmus or the gradual wasting away produced either by the repeated hemorrhages, the exhausting serous discharges, or, if these are checked, by the septic and toxic influence of the disease on the nutrition of the body.

The tendency of the newly-formed cells of cancer is to rapid death. The more prolific and abundant, therefore, the cell-development of the neoplasm, the more speedy will probably be its self-destruction and decay. In consequence of this rule the epitheliomatous and encephaloid varieties are the most rapid to break down and slough away; the scirrhous remains unchanged the longest, and usually does not undergo gangrene until it has changed from its hard fibrous to the soft cellular character. Death usually takes place most rapidly, therefore, in the two first-mentioned varieties.

The disease does not remain limited to the tissues of the uterus alone, but very rapidly spreads after a certain time—that is, when it has once begun to invade the neighboring organs—to the vagina, bladder, rectum, pelvic cellular tissue, and even the peritoneum, ovaries, and tubes. In very virulent cases the lymphatics and veins surrounding the cervix are involved at a period when the examining finger fails to detect any pathological changes in them, and hence the possibility of an entire removal of the diseased tissues is really never perfectly assured. Compression of the ureters by the cancerous deposits may, in addition to hydronephrosis, cause inflammation of the ureters and of the lining membrane of the kidney, and gradually induce destruction of that organ or its fatty degeneration—that is, Bright's disease. Œdema of the labia and lower extremities in consequence of the pressure exerted by the malignant deposit on the pelvic veins is a not infrequent symptom in the later stages.

Metastasis of the cancerous deposit to other distant organs of the body is fortunately not common with cancer of the uterus, the occurrence of cancer in other not adjacent organs being either the result of a gradual spreading of the disease or else independent. Patients with cancer of the uterus not infrequently succumb to sudden attacks of peritonitis (25 per cent.), from a perforation into the peritoneal cavity, or from putrid discharge through the tubes. Uræmia is also reported to be the cause of the fatal termination in about 45 per cent. As already remarked, gradual exhaustion is the most common cause of death; life being often prolonged, however, by the arrest of retrograde tissue-changes induced by the large consumption of opium which we feel it our duty to give to these patients in sufficient amount to allay their sufferings.

Part of Uterus affected.—Cancer much more frequently affects the neck than the body of the uterus, although some authors, with whom we decidedly agree, look upon cancer of the body as much more common than is generally thought.

CANCER OF THE BODY OF THE UTERUS.—Although cancer developed in the body of the uterus has attracted very little attention, it is by no means exceedingly rare. Among the most recent statistics on this subject are those of Schroeder, who found 28 cases of cancer of the body among 812 cases of cancer of the uterus, and Schatz saw 2 among 80 cases.

The most marked feature of the affection thus making its appearance is the obscurity which attends diagnosis. For a long time, and perhaps throughout the case, uterine hemorrhage and fetid discharges will be the only symptoms which will excite suspicion. These leading to further and fuller exploration, a portion of the morbid tissue will be removed by the curette, examined by the microscope, and thus the diagnosis will be established.

Scirrhus, which is so rare as to be denied by some even in the neck, never affects the body, and so rarely does encephaloid do so that some pathologists declare that no unquestionable case is on record. The supposed cases are, according to them, really instances of sarcoma, tuberculosis, or sloughing fibroid growths. When malignant disease does originate in the cavity, it assumes the form of epithelioma.

Peculiar Features of Cancer of the Body.—The symptoms which mark the condition are—

Hemorrhage, especially if occurring after the menopause;
Depreciation of vital forces;
Cachectic appearance;
Fetid discharge;
Pains of severe and lancinating character.

These symptoms having led to examination of the uterus, the following physical signs will probably be recognized:

Enlargement and hardening of uterine body noticed by bimanual palpation;
Increased capacity of uterus ascertained by the probe;
Profuse hemorrhage upon probing;
Recognition of peculiar intra-uterine growth by introduction of finger;
Microscopic evidences of cancer.

Differentiation of Cancer of the Body.—When the rational and physical signs here enumerated are carefully developed and considered, a very probable diagnosis may be arrived at. Nevertheless, errors of diagnosis are common in reference to this disease at the hands of practitioners who are not familiar with the subject, or who rely too firmly upon one or two of these signs or symptoms. We have seen each one of the following conditions mistaken for cancer of the body, and some of them we have known to have repeatedly caused erroneous diagnosis:

A sloughing fibroid;
A retained placenta;
A sponge left by accident *in utero;*
Syphilitic disease of pelvic bones;
Cystic degeneration of chorion (hydatids);
Fibroid tumors or polypi;
Entero-uterine fistula;
Intra-uterine vegetations.

We do not deem it necessary to go into detail upon the means necessary for accomplishing the differentiation of these affections from malignant disease. It will suffice to say that in cases in which doubt exists after careful investigation by all the other means here recommended, removal of a small portion of a mass and its examination by the microcope will prove of the greatest assistance, and will probably decide the question.

The not infrequent occurrence of sarcoma of the body of the uterus, which, as already described, is practically quite as malignant as true carcinoma, should not be forgotten in deciding as to the nature of a presumed malignant growth of that organ. In order to remove a portion of the intra-uterine growth sufficient for microscopical examination, the curette, either blunt or sharp, will usually suffice. Only a small portion is needed for the purpose, and no serious damage need ever be done in this manner.

TREATMENT.

The indications for treatment are these:

To amputate or destroy the diseased part as completely as possible;
To check hemorrhage;
To relieve pain;
To secure perfect cleanliness and correction of fetor;
To sustain the general strength.

Review the complications of uterine cancer, and it will be seen that many of them are of a most fatal character, and at the same time entirely beyond the resources of art. A certain number, however, which would prove fatal if not avoided or checked, are temporarily under the control of the physician. Examples of these are septicæmia, hemorrhage, exhaustion from pain, ichorous leucorrhœa, hydrorrhœa, excessive constitutional debility from the depraved blood-state, and last, though not least, the extreme mental depression which is the consequence of bereaving the unfortunate sufferer of all hope.

No single plan fulfils so many of the indications for alleviating these as removal or destruction of the growth, but no practice in reference to this disease can be so pernicious as that based upon the idea that because there is cancer of the uterus some surgical procedure must be resorted to. The same reasoning which applies to malignant diseases in other parts of the body should do so here. If the operator be convinced that decided benefit is to accrue to the patient from surgical interference, it should be practised, not otherwise. Should the disease be detected early, and sufficient grounds be discovered for a positive diagnosis, the propriety of complete removal of the cervix by amputation cannot be questioned.

In the great majority of cases patients suffering from uterine cancer are seen so late that surgical interference, established with a view to cure, necessarily fails to effect it, although, practised for relief of certain symptoms, and thus for a prolongation of life, it is frequently of a great deal of benefit. Should amputation of the neck promise entire removal of the morbid tissue, it should at once be accomplished, for by it cure may be effected. Even where complete removal is not practicable, ablation of all the superficial portions of the growth tends greatly to the amelioration of symptoms.

There are several surgical procedures by which removal of the diseased structure may be effected. One of these will be most applicable to one case, one to another, that being always selected which in the particular case will accomplish the end with the greatest thoroughness. Let it always be borne in mind that the hope of prolonged freedom from relapse depends upon thoroughness of ablation, and upon that alone.

According to the conditions existing in each case, the treatment of cancer of the uterus should be either radical or palliative. By "radical" is meant the removal of the whole of the diseased tissue, with at least a fair prospect of permanent cure. By "palliative" we mean that the disease has already so far advanced that its radical cure is impossible, and that nothing but a mere relief of symptoms can be effected.

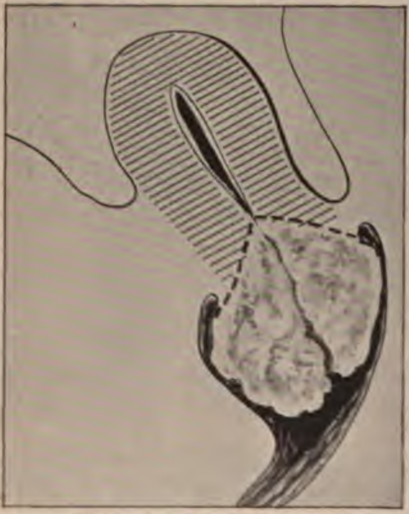
Radical Treatment.—There are two main varieties of radical treatment for cancer of the uterus. If the disease is confined solely to the cervix, we may employ two forms of radical cure—namely, first, the excision of the cervix only; or, second, the removal of the whole uterus. If the disease is limited to the body of the uterus, or if the body of the uterus is involved together with the cervix, only the removal of the whole organ will effect a cure.

Removal of the Whole Cervix: Indications.—When a careful vaginal and bimanual examination, supplemented by ocular inspection through the speculum, proves conclusively that the cancerous infiltration is limited to the tissue of the cervix alone, does not spread upward above the internal os or laterally into the pelvic cellular tissue or to the vagina, then an entire cure *may* be effected by completely removing the diseased tissues and leaving the rest of the uterus undisturbed. It is but fair to say that the exact limit of the spread of the disease either upward or laterally is not always easy to determine, since, as we have already remarked, even the most practised examining finger may fail to detect the microscopical spreading of the cancer-elements into the parametrium, and the eye is not able to appreciate the extension of the disease toward the uterine cavity; hence the majority of operators, especially the Germans, nowadays prefer to remove the whole uterus, even though the cervix only is apparently diseased; still, excellent results from removal of the cervix alone are reported by Carl Braun of Vienna, by Schroeder of Berlin, by Baker of Boston, and by Reamy of Cincinnati.

Methods.—There are three chief methods for performing this operation:

a. Excision.—This is the method of Schroeder and of Verneuil. After drawing down the cervix with a vulsellum forceps, two lateral silk or wire ligatures are passed deep into the vaginal cul-de-sac for the purpose of securing the uterine arteries. These are tied or twisted, and then an incision is made transversely through the anterior vaginal wall, the bladder pushed up with the fingers or scalpel handle until the level of the internal os is reached. A similar incision is made behind and the peritoneum pushed up in the same manner. The two incisions are then joined, and the cervix is excised in a wedge-shaped manner with the knife or scissors. There is danger of wounding the peritoneum during this operation, and if this is done the opening should be at once closed by catgut sutures; bleeding vessels are at once tied with catgut. Deep sutures are now passed through the vaginal and cervical walls on each side, and tied so as to compress all bleeding surfaces and cover the stump with vaginal mucous membrane. Union by first intention may thus be secured. According to Hofmeier, who published Schroeder's results and those of some of his assistants during the five years between 1879 and 1884, out of 105 partial excisions of this kind only 10 died, and the remote results as regards non-recurrence of the disease were excellent. According to the latest figures, there was 47 per cent. of permanent recoveries. Baker practises substantially the same operation, with the quite important modification, however, of not suturing the wounded surfaces, but instead cauterizing them very deeply with the Paquelin thermo-cautery heated to a black heat. In the *American Journal of Obstetrics* for 1888 he reported 57 high amputations after this method, with only 2 deaths. Of 29 cases during a period varying from one to fourteen years, a return of the disease was observed; the 26 others operated during a term of one to fifteen years remained in perfect health.

FIG. 278.

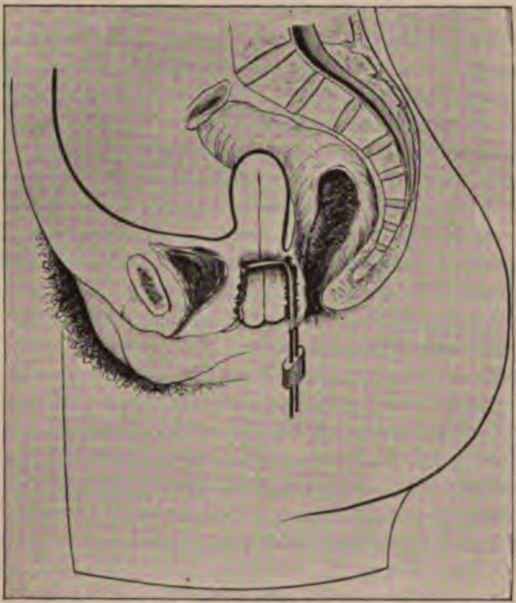


Wedge-shaped Excision of Cervix.

The method of Verneuil, as described by Pozzi in his recent work, is similar to that of Schroeder so far as the extent of the part removed is concerned, but instead of using the knife or scissors he uses the écraseur—an instrument which we have long since discarded in all operations where it was desirable to know exactly how much tissue would be removed without accidentally drawing parts into the bite of the chain which it was desirable to omit; hence we infinitely prefer sharp cutting instruments, the exact limit of which we can guide and foresee, to the uncertain effects of the écraseur or constricteur.

b. Amputation of the Cancerous Cervix by the Galvano-cautery Wire.—This was formerly a favorite operation of ours in cases where the disease was of the cauliflower variety and entirely limited to the intravaginal portion of the cervix. We have not practised it much of recent years, because we have not chanced to meet with cases where the mere linear amputation of the cervix seemed to offer hopes for a complete cure, and partly because we have preferred to give the patients the greater chances of high excision or complete extirpation of the uterus. The diseased cervix is drawn down by vulsella in the same manner as described for the previous method; the platinum wire loop is passed around the cervix on a level with the vaginal vault, tightened, and the current gently turned on, the screw being very slowly moved, so as to cut through the part without producing hemorrhage. If the cervix has been well drawn down, the amputation usually is effected at a higher point than is apparent by sight, so that when the uterus is allowed to recede after removal of the diseased portion, a funnel-shaped cavity appears; and if the operation has been carefully performed the depth of this funnel will usually be at or very near the internal os. The disease is therefore, if entirely confined to the cervix, very thoroughly eradicated by this method, besides the security against return given by

FIG. 279.



Amputation of Cervix by Galvano-cautery Wire.
(The cervix is not shown diseased in this cut, which is really designed to represent the amputation of the cervix in prolapsus uteri.)

the searing of the wound. Carl Braun[1] is the particular advocate of this method, and has reported 156 cases with 9 deaths (6.6 per cent. mortality). In 33 cases he found that the disease had not returned after one year—that is, 6 per cent.; in 26 cases, or 20 per cent., after two years. Two were still well after twelve, and 1 after nineteen and a half years. We (P. F. M.) have had one case of complete recovery after amputation with the galvano-cautery loop of the posterior lip of the cervix for epithelioma in the third month of pregnancy; the woman went to term, had a normal delivery, and the disease showed no signs of reappearance one year later.

c. Destruction of the Diseased Cervix by Means of the Sharp Curette, Scissors, and Cautery or Caustics.—This method should really appear under the heading of palliative treatment, since only in very exceptional cases is a radical cure to be expected from it; still, such does occasionally occur in cases where the disease is limited to one lip of the cervix or to the lining membrane of the cervical canal only. By a very thorough removal of the diseased tissue by the stiff sharp spoon of Simon, followed by the production of a deep slough by the thermo-cautery or a saturated solution of chloride of zinc applied on pledgets of cotton, the entire destruction of the cancerous tissue may be effected. We (P. F. M.) have seen at least one such case in which the microscope made the undoubted diagnosis of epithelioma. Of course in all these three methods the after-treatment by tamponade with iodoform gauze so long as there is any danger of hemorrhage, and the use of milder caustics, such as the stick of nitrate of silver or nitric acid, is indicated until whatever raw surface remains is healed.

As yet authorities are divided as to whether this partial removal of the uterus should be practised in preference to the complete extirpation of the organ, which latter we will now proceed to describe.

Hysterectomy, or Complete Removal of the Uterus.—The removal of the uterus for cancer may be effected either by abdominal section or through the vagina. We need but refer to the former method, since it has now been practically abandoned in favor of the very much safer and equally efficient vaginal method. Freund of Strasburg was the first who in 1878 revived the removal of the uterus through an abdominal incision, and practised it a number of times. He was followed by Schroeder, Billroth, Czerny, and others, but the mortality was so great after this operation, and even in the cases of recovery the recurrence of the disease so frequent, that it was soon given up, and it may now be said to be entirely obsolete. According to Karl von Rokitansky, of 95 cases operated upon after Freund's method, 65 died under the operation, and of the remaining 30 not one escaped without a recurrence of the disease.

Vaginal Hysterectomy.—This operation dates back very much farther than is generally supposed, since it was first performed by Langenbeck in 1813, the patient living thirty years after the operation. In 1822, Sauter of Zurich performed the same operation, the patient recovering, but dying four months later. Blundell repeated the operation in 1828, and in 1830, Récamier and Delpech together did the same.

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[1] Pawlik, *Wiener klinik*, December, 1882.

After this time the operation seems to have been more or less forgotten until the high mortality of Freund's abdominal method induced Prof. Czerny of Heidelberg in 1879 to revive it, in which action he was speedily followed by Schroeder, Olshausen, Martin, Billroth, Fritsch, and others, until now the statistics of vaginal hysterectomy for cancer foot up to a total of many hundreds. Practically, however, the operation as now performed is scarcely a dozen years old.

Indications.—The one chief indication for the complete removal of the cancerous uterus through the vagina is the positive and absolute limitation of the disease to that organ. As already stated, authorities are still in doubt, at least in this country and in England, as to whether cancer of the cervix warrants the removal of the entire organ; in Germany, with the exception of Carl Braun and possibly some others, the question is settled in favor of the complete extirpation. As regards the justifiability of removing the whole uterus in cases of cancer of the body of the organ there can, of course, be no discussion. It is for this special location of cancer that the complete removal of the uterus seems expressly indicated.

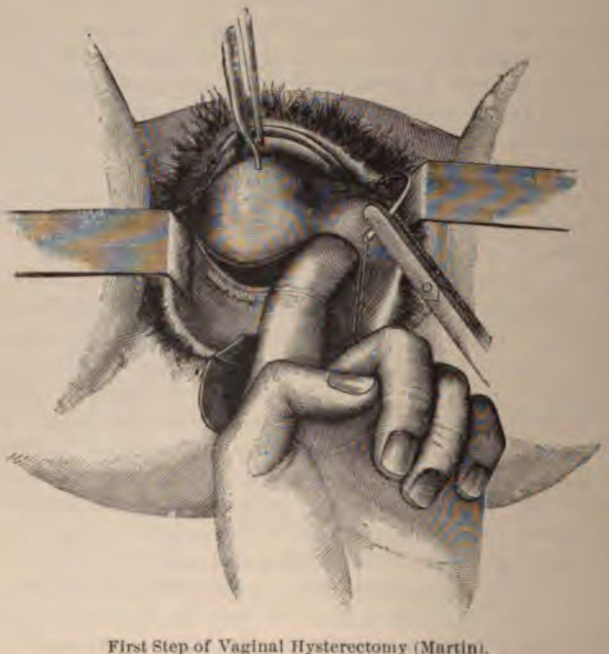
Contraindications.—Whenever there is the slightest appearance or even suspicion of involvement of the para-uterine tissues (vagina, broad ligaments, pelvic cellular tissue, bladder, or rectum) in the cancerous degeneration, the removal of the whole organ is absolutely contraindicated. We are aware that in making this positive statement we are opposed to the views and practice of many prominent operators, notably in Germany, who have often removed the uterus with a portion of the diseased adjacent tissues, with a recovery of the patients from the operation; but our experience and logic lead us to except such cases from those warranting the operation, since it is scarcely probable, or even possible, that the disease can have been entirely extirpated under such circumstances.

Methods.—A number of technically more or less different methods of vaginal hysterectomy have been introduced and practised by different operators. Schroeder advised opening the posterior cul-de-sac first, retroverting the uterus and drawing the fundus out through the opening, and then to proceed to ligate the broad ligament on either side with several strong silk ligatures and divide the attachments. Finally, the anterior cul-de-sac was opened and the bladder detached from the vagina. Czerny first opened the anterior cul-de-sac, incised the vaginal vault completely around the cervix, pushed up the bladder, opened Douglas's pouch, and then retroverted the uterus. Finally, the broad ligaments were ligated in from three to six portions on each side, and the uterus excised. Olshausen does not retrovert the uterus, but draws it down with vulsella inserted into the cervix, incises the vaginal wall all around, gradually separates the connections of the bladder and rectum with the finger, ligates bleeding vessels, opens the peritoneal cavity in front and behind, and ties the broad ligaments by an elastic ligature passed through by means of an aneurism needle, and then removes the organ. Peter Müller advised cutting the uterus in half and removing each half separately. This method applies chiefly to cases where the organ is very much enlarged, and is not generally practised.

Fritsch ligates the tissues step by step, first on one side and then on the other, drawing the uterus down as far as possible by vulsella, and dividing the tissues between the uterus and the ligated portions as he proceeds. The anterior cul-de-sac is then opened, the bladder pushed up, bleeding vessels secured, the same done to the posterior cul-de-sac, and the remaining attachments of the uterus then divided.

Operation.—The method which we have employed, and which is substantially that of Martin and Fritsch combined, is the following: With the patient in the lithotomy position the vagina is thoroughly disinfected with a 1 : 5000 bichloride solution, gangrenous and infectious portions of the cervix having been removed by the curette either previously or at the same time. The cervix is firmly seized with one or two vulsella forceps, drawn down as far as possible to the vulva, and two deep ligatures of stout silk are passed through each lateral vaginal pouch, and tied in order to compress the uterine arteries. The cervix being now pulled sharply upward, a transverse incision is made well outside of the diseased tissue in the posterior cul-de-sac, and Douglas's pouch speedily opened. The opening is enlarged with the fingers, and the peritoneum stitched by quite deep sutures of catgut to the vaginal wall. This is a very important point, because severe hemorrhage is likely to occur from the vessels in the cellular tissue, the blood running into the peritoneal cavity during the rest of the operation and being overlooked. We are convinced that two of our fatal results among our early opera-

FIG. 280.



First Step of Vaginal Hysterectomy (Martin).

tions were due to our having omitted to notice this hemorrhage. A well-disinfected sponge of the size of an egg, with a long string attached, which should be black in order to distinguish it from the ligatures, is passed up into the abdominal cavity in order to prevent the intestines from coming down. The index finger of the left hand is now introduced into the abdominal cavity through the opening in Douglas's pouch, and the vaginal wall on the left side lifted up sharply (Fig. 280). With a stout aneurism needle or a so-called Deschamps needle curved toward the left a strong silk ligature is passed about a quarter of an inch from the border of the uterus and securely tied, one end being cut short. The tissue included by this ligature is now divided by scissors and another one applied higher up, and so on until the upper limit of the cervix has been reached. The same procedure is now repeated on the right side, and when both sides have thus been ligated and separated, the uterus remains attached only by the upper portion of the broad ligament and the connection with the bladder. The finger in the abdominal cavity now pushes forward the anterior cul-de-sac on one side, and an incision is made transversely through the vaginal wall, and the bladder pushed up with the index finger of the right hand or with the handle of the scalpel, a sound being kept in the bladder at the same time for greater safety. The peritoneum between bladder and uterus is now sharply pressed upward by the left index finger in the abdominal cavity, and opened by scraping with blunt scissors. The fingers enlarge the opening transversely, and nothing now remains to do except to ligate by successive stages the remaining attachments between the uterus and the upper portion of the broad ligament. Usually the ovaries and tubes come into view during these last stages if the firm traction on the organ, which should be kept up during the whole operation, is not relaxed; and of course it is best to include these organs in the ligatures and remove them with the uterus. This is not always done, it is true, but we have always endeavored to do it, and have usually succeeded. To leave the ovaries behind is simply to subject the patient to the annoyance of a continuance of an entirely unnecessary function—namely, menstruation. We have found the last stages of the operation—that is, the ligation and division of the upper portion of the broad ligaments—to be among the most difficult and misleading of the whole procedure; still, a perseverance on the lines indicated above can but result in perfect success. It will be noticed that in this description the uterus is neither retroverted nor anteverted, except perhaps at the last moment, when the upper portion of the broad ligament is divided, but that it is removed in precisely the axis which it occupied in the body.

As soon as the uterus has been removed the anterior peritoneum and vaginal wall should be sewed together with catgut, if this was not already done when the peritoneum was opened; and it is a good plan to stitch the stumps of the broad ligaments to the vaginal incision on either side. Any bleeding vessels must be caught up and tied or the bleeding stopped by sutures passed underneath them, and the operation should not be considered completed until every vestige of bleeding is entirely arrested. The sponge is now removed from the abdominal cavity, and it will be found that, quite to the surprise of the novice, the opening in the vaginal pouch is comparatively small; indeed, many operations are performed without the intestines or omentum ever appearing to view. Some operators recommend closing the vaginal vault entirely, but it is preferable to provide for drainage, and the majority therefore leave it open, packing the vagina lightly with iodoform gauze. The ligatures are carried out of the vagina and tied together in bundles, separating those of the anterior, posterior, and lateral walls respectively. The patient is now put to bed, and an ice-bag may be applied over the abdomen if the operator thinks it desirable. The operation, according to the skill of the operator and the greater or lesser difficulty of the case, may last from twenty minutes to an hour.

The after-treatment consists in drawing the urine if the patient cannot void it herself, keeping her carefully in the recumbent position, although allowing her to turn on either side as she desires, moving the bowels after the third or fourth day by mild laxatives or enemas, and scrupulously avoiding any interference with the gauze packed into the vagina until at least the fourth day, even though the gauze may be saturated by the secretion, usually sanious, from the wound. On the fourth day, or perhaps even later, the gauze should gently be removed and need not be replaced. Vaginal injections should be scrupulously avoided for at least a week, and even then be postponed until the complete closure of the vaginal vault seems assured. Cases are on record where early vaginal injections re-opened adhesions, permitted the entrance of the injecting fluid into the peritoneal cavity, and caused death.

In place of ligatures to compress the vessels of the broad ligaments, stout long forceps have been used by Péan and Richelot (both of whom claim the priority of this suggestion), which are left *in sitû* for from forty-eight to seventy-two hours, until complete obliteration of the compressed vessels has been attained. In using these forceps the posterior vaginal vault is first opened, and all bleeding vessels secured by catgut ligatures, as already described; the anterior vaginal vault is then opened on the finger into the peritoneal cavity, the bladder separated, and the peritoneal and vaginal walls sewed together with catgut. The broad ligaments having thus been isolated on either side, one large clamp is passed from above and the other from below, effectually grasping between them all the tissues of the broad ligaments. The uterine attachments are then divided, and the same manœuvre repeated on the right side. The handles of the clamps should be secured by ligatures, and, if thought best, the blades of the clamps may be prevented from slipping by passing a deep silk ligature through the broad ligaments on each side and tying it over the clamp. Special clamps of proper thickness and length have been devised for this purpose by Péan, Richelot, Cleveland, Polk, and others. Undoubtedly, there is a great saving of time by the use of these clamps, but, unfortunately, not every case permits of their employment. They are said to produce sloughing and adhesions of intestines and omentum to the edges of the wound, and hence we believe many operators who formerly employed them have returned to the use of the progressive silk sutures as described above.

Some operators have employed as many clamps as appeared necessary to compress all bleeding vessels, using a clamp in place of each ligature, as described above in the operation practised by us. Thus a dozen clamps or more might be left in a wound. The handles are carefully protected by being wrapped with iodoform gauze.

It is curious to notice the entire absence of shock, pain, and of any evidence of a severe operation having been performed in the patients who have undergone a successful vaginal hysterectomy; they appear like women after a normal labor. It is scarcely safe to allow the patient to sit up under two weeks. The ligatures should be removed gradually as they become loose, gentle traction being made every now and then after the first two weeks. We have seen them retained as long as six weeks after the operation, requiring finally to be removed by scissors.

Dangers.—The chief dangers from this operation are—primary and secondary hemorrhage, shock, septicæmia, and peritonitis. Both primary and secondary hemorrhage can be controlled or guarded against by a careful employment of sutures and ligatures, and the precaution never to leave the patient until all trace of bleeding has been completely arrested. Shock should really never occur, and indeed we doubt whether, when it does take place, it is not due to a concealed hemorrhage rather than to what is really known as "shock"—that is, acute nervous prostration. Septicæmia is of rare occurrence if careful antiseptic precaution—that is, irrigation by a very weak bichloride solution, 1 : 10,000, or, what is safer and equally good, the Thiersch solution—has been kept up during the operation. Peritonitis likewise is but rarely to be feared.

One danger, the avoidance of which lies almost entirely in the hands of the operator, is the accidental injury of the bladder and ureters during the operation. This accident has occurred to some of the most skilful operators, and therefore by no means necessarily implies carelessness or want of skill on the part of the surgeon. If the bladder is opened, it should be immediately sutured with catgut, and the wounded ureter if possible restored to its continuity by the same method. Occasionally the ureter has not been wounded, but been included in one of the ligatures; and if this accident has occurred on both sides, acute retention of urine and acute uræmia, with convulsions, coma, and rapid death, have been the result, the cause of the fatal issue not being discovered until the autopsy was made. This accident can almost always be avoided if care is taken to push up the bladder sufficiently, so that it and the ureters are away beyond the reach of the knife and ligatures.

Results.—The results of vaginal hysterectomy may be divided into immediate and remote.

Immediate results means the percentage of recoveries from the operation. While the early operations showed a comparatively large mortality, recent statistics seem to prove that the operation is not a very dangerous one; the most recent figures being those of Leopold, who out of a total of 80 operations had only 4 deaths, or a mortality of 5 per cent.; Kaltenbach, out of 55 but 2 deaths, or 4 per cent.; Ott had 30 operations with no death; Péan, 25 operations with no death. Unquestionably, the percentage of mortality will depend very greatly both upon the skill of the operator and upon his choice of favorable cases; still, we have operated on several in which the extension of the disease to the broad ligaments (not recognized until during the operation) rendered them very unpromising and difficult, with complete and uneventful recovery.

Remote Results—that is, Permanency of Cure.—Accordingly as the indication for the performance of vaginal hysterectomy for cancer, either of the cervix or body, has been correctly followed, a complete cure—that is, non-recurrence of the disease—is to be expected. If the operator is perfectly sure that his line of incision has gone through entirely healthy tissues, and that he has succeeded in completely extirpating the cancerous material so far as his finger and eye permit him to judge, he should reasonably expect to have effected a permanent cure. Cancer, being at its outset unquestionably a purely local disease, can be undoubtedly permanently cured if all the diseased tissue with every possible ramification is thoroughly removed. The difficulty of making a correct estimate of the limit of the cancerous infiltration is as yet the great obstacle, not only to the formation of an infallible indication for hysterectomy, but also to the absolute certainty of a complete removal of the diseased tissue. Hence for the present it is almost impossible for us to say in a large number of cases whether we have succeeded by the complete extirpation of the diseased uterus in effecting a permanent cure or not. Even though we firmly believe that this has been the case, we may find, to our regret and surprise, that sooner or later, even after as long an interval as two or three years, the disease reappears at some point of the cicatrix. This recurrence cannot be considered in the light of a new cancerous infiltration, but merely as a cropping out of latent germs of the disease which were not apparent at the time of the operation. We are still, therefore, obliged to judge of the justifiability of vaginal hysterectomy for cancer and of the permanency of the cure thus effected by statistics reported by surgeons who have a large number of cases of this operation to record.

Among the latest of these series is that published by Leopold, who lost but 4 out of 80 vaginal hysterectomies. Of the 76 women who recovered, the first dating back five and a half years, 14 have since succumbed, of whom 10 only died in consequence of a recurrence of the cancer. Of the 62 still surviving, 3 only have been attacked by a recurrence; the others are cured, the time since the operation varying from five and a half years to one year and three months.

Of 76 patients remaining under observation after recovery, there were free from recurrence—

At 5½ years	3	At 2½ years	2
4¼ "	2	2¼ "	2
3¾ "	3	2 "	3
3½ "	1	1½ "	3
3¼ "	6	1¼ "	3
3 "	2	Between 1 year and 3 months	4
2¾ "	3		

It will thus be seen that 72 of these 76 cases were still well, without recurrence of the disease, from one to five and a half years after the operation. Certainly, one cannot ask for much better results in a disease which invariably proves fatal if allowed to proceed undisturbed. Our rather limited experience with vaginal hysterectomy leads us, unfortunately, to deplore the fact that we but rarely see cases of cancer of the uterus in which the indication laid down in the preceding pages can be scrupulously carried out. The vast majority of cases of this disease which come to our notice have advanced so far that there is little or no prospect of entirely removing the diseased tissue by any of the methods which we have described. There can, in our opinion, be no doubt whatever that if cancer of the cervix or of the body of the uterus is observed at a stage so early that the surrounding tissues are absolutely healthy, a complete cure can be achieved by an entire removal of the affected part or the whole organ. This rule, we believe, applies to cancer situated in any part of the body where its surgical ablation is practicable without interference with vital functions.

Before concluding the discussion of the justifiability of the radical operations for cancer of the uterus, we wish to state our conviction that whenever there exists a reasonable chance that the disease can be entirely eradicated by the removal of the cancerous cervix or of the whole uterus the patient should be given that chance. But we are unquestionably of the opinion that to remove the whole uterus, or even to perform high amputation of the cervix, when the cancer has already invaded neighboring tissues which it is impossible for us to excise or destroy, is not only useless, but unjustifiable. Furthermore, we are inclined to favor the removal of the entire organ by the vagina even in cases of cancerous disease of the cervix alone, rather than to take the chances of a high amputation of the cervix when possibly the disease has already extended beyond the internal os. The mortality of vaginal hysterectomy (Leopold, 5 per cent.) is so low that it need not be feared.

Merely as a matter of record we will state that Zuckerkandl and Woelfler have proposed and practised the removal of the cancerous uterus by means of an incision made over the sacral region, claiming that it is much easier in this manner to expose and extirpate the organ. Those operators who have had occasion to perform vaginal hysterectomy will scarcely find it necessary to adopt this new procedure, and it is very doubtful whether it will gain many adherents.

Palliative Treatment.—As already stated, by far the larger majority of cases of cancer of the uterus are seen at a stage when the invasion of the vagina and parametrium by the disease renders a radical cure impossible, and restricts us to the mere endeavors to alleviate the symptoms of which the patient complains and to prolong her life. When the cancerous infiltration or ulceration has spread to the vaginal wall; when the examining finger feels in the cellular tissue about the cervix a hard, more or less extensive, infiltration evidently connected with the diseased cervix; when the uterus is immovable in consequence of this infiltration or of cellulitis or peritonitis; when the inguinal glands are affected (which usually occurs in uterine cancer at a very late stage); when the pelvic blood-vessels and lymphatics are compressed or diseased, as shown by œdema of the labia, suprapubic region, or thighs; when the recto-vaginal and vesico-vaginal walls are involved; finally, when compression of the ureters by the disease has produced dilatation of those ducts and perhaps of the renal pelvis,—in all these conditions it is futile to attempt a radical cure.

But let it not be understood that every case of incurable cancer of the uterus necessarily demands active or even surgical interference. In many instances the patient suffers very little pain; there is no bleeding, no offensive discharge, for the reason that the extension of the disease is submucous or hidden underneath the vaginal walls, and no superficial ulceration exists; or else the spread of the disease is so slow that it produces but little inconvenience. In such cases it is far better to attempt to build up the health of the patient by general tonics, chiefly iron and arsenic, relieve such pain as may come on at times by morphine suppositories given as pain may require, by antipyrin or phenacetin, than to attempt to arrest the disease by local application of caustics or escharotics, which will invariably prove useless. The administration of Chian turpentine has been recommended by Clay of Manchester, endorsed by a number of others, as a means of arresting the growth of cancer of the uterus, and indeed entirely curing a certain if small number of cases. We have used the drug sufficiently often to feel that it, in our hands at least, was entirely devoid of any effect upon the cancer, and indeed of any effect whatever except that of disturbing the patient's digestion. We have therefore given up its use. At the time of the condurango craze some fifteen years ago we were induced to use this agent in the shape of an infusion in several cases of carcinoma of the uterus, and, while we did not see that it exerted any influence on the disease itself, its stimulant effect upon the digestive organs was such as to, for a time at least, decidedly benefit the patients. We would look upon it, therefore, as a gastric tonic, while absolutely disclaiming any belief in its efficacy against cancer. Warburg's tincture without aloes, in capsules, in doses of one-half to one drachm, three times daily, and Huxham's tincture, are excellent remedies to build up the general health and increase the blood-supply of the patients. While we have mentioned arsenic as a good tonic in these cases, we do not share the belief of some—among others the late Dr. Washington L. Atlee—that it exerted a specific curative effect upon the cancer-germs. As regards the use of opium in cancer of the uterus, we will merely say that we give it and allow it to be given in proportion to the necessity for it—that is, as required by the pain experienced by the patient. A woman who is sure to die within a more or less limited period from a very painful disease certainly has a right to expect that her life should be made as comfortable as possible during the time which she is still to suffer. We therefore allow our patients afflicted with cancer to use their own discretion about the amount of morphine which they think they require; of course always being careful to caution them against using more than a perfectly safe quantity in a certain given time. Usually we administer the drug in the shape of suppositories, although some patients become quite adept with the hypodermic syringe.

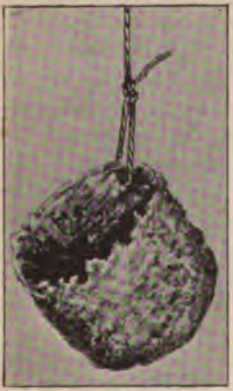
It is our invariable rule never to acquaint the patient with the nature of her disease if we can possibly avoid it. By telling her that she has an ulcer, a tumor, a sore, or something of that kind which will require speedy operation and perhaps prolonged treatment, we can usually escape answering the direct question whether her disease is cancer or not. It is simply brutal to deprive a woman of all hope of recovery by telling her point-blank that she has cancer, and only when the patient insists upon knowing the truth have we deviated from this rule.

When, therefore, cancer of the cervix or body of the uterus does not materially incommode the patient by local manifestations, but is merely gradually undermining her health in the subtle manner already mentioned as characteristic of this disease, it is best to abstain from all local treatment and to confine ourselves to maintaining the tone of the general system and to prolonging life by all means at our disposal. We have thus seen cases of cancer of the cervix run three and four years with comparatively little local disturbance, the patients gradually emaciating, and eventually dying, from the toxic influence on the general health.

When, however, there is severe hemorrhage recurring more or less frequently; when the disease is spreading rapidly to the neighboring parts; when there is a foul, irritating discharge, whether accompanied or not by the evidences of septic infection,—it becomes our duty, in our opinion, to endeavor to arrest the process of development and control the symptoms to the best of our ability. The methods at our disposal for these purposes are the following: first, curette; and seccond, chloride of zinc. The most efficient means at our command for the control of hemorrhage from a cancerous cervix or even body of the uterus is the sharp curette. With it the bleeding cancerous granulations or the sloughing gangrenous particles are scraped away, hemorrhage and septic infection are at once arrested, and under appropriate after-treatment perhaps permanently removed. Of course the disease goes on, but the patient is far more comfortable and her life is prolonged for a certain time.

Operation.—We usually perform this operation through the Sims speculum, although it may be accomplished simply by the touch with the patient in the dorsal position; but we prefer the Sims position, because it enables us to see the affected part and afterward to apply such caustics as may be indicated. With a stout sharp Simon's scoop the cancerous tissues are rapidly and thoroughly scraped away, so that in place of a superficial ulceration, or even of a papillomatous growth, a more or less deep cavity in the cervix is formed. By using smaller curettes the diseased tissue may be thoroughly removed far up into the uterine canal, and we have often thus excavated the whole cervix, leaving but a shell, the upper limit of which reached within the cavity of the body of the uterus. When all the soft cancerous tissue has been scraped away, which is easily recognized by the curette, and the hard, gritting muscular substance of the uterus is reached, the curette should be laid aside, and now, the cavity having been thoroughly mopped with cotton or sponge soaked in very hot water and dried, it may be cauterized by the Paquelin thermo-cautery, or, if one wishes to produce gradually an even deeper slough, by the application of the chloride of zinc. This is done by inserting small flat pledgets of absorbent cotton, soaked in a 50 per cent. solution of chloride of zinc in water and dried, into the excavated cavity, so as to touch every portion of its walls. This should be done rapidly, and the vagina is then carefully tamponed with flat pledgets of cotton soaked in a solution of bicarbonate of soda, the object of which is to neutralize any excess of the chloride of zinc and to protect the vaginal walls from the possible undesired action of that caustic. It is well to render these vaginal tampons aseptic by means of plentiful distribution of iodoform blown in through an insufflator. The tamponade of the vagina may be concluded by a long strip of iodoform gauze, which will keep the tampons so sweet that they can be left undisturbed for forty-eight or even seventy-two hours. Then the vaginal packing should be changed, the zinc pledgets being left, and the vagina being repacked with iodoform gauze. In from four to six days after the original operation the zinc tampons will be found loose and can be removed, and a few days later the slough caused by the zinc will be found detached, and can often be lifted out of its socket with forceps in one piece. (See Fig. 281.) After this has been removed it should be the endeavor of the physician to cause the cicatrization of this cavity by touching it with nitric acid or with a stick of nitrate of silver every few days, and by packing it with iodoform and tannin powder, equal parts, in order to contract the granulations and prevent discharge and hemorrhage. This treatment may have to extend over a number of months, but by its persistent continuance the disease may be kept very much in check, the patient made very comfortable, and her life prolonged by a number of months. In spite of this treatment, the granulations may grow again, and the curretting and subsequent application of chloride of zinc require repetition once or oftener. But the treatment is not very severe, and is usually not attended with danger. The sharp curette employed in this manner was first introduced into practice by the late Prof. Simon of Heidelberg, and has been described by Mundé in an article entitled "Treatment of Cancer of the Uterus with the Curette," published in the *American Journal of Obstetrics* for August, 1872. The additional use of chloride of zinc as a means of removing a larger amount of the cancerous tissue than is practicable for the curette to do (possibly curing a case here and there) was first recommended by the late Dr. Marion Sims (see *American Journal of Obstetrics*, 1879), and has since found many imitators. We are heartily in favor of it, and employ it almost invariably after the curette.

Fig. 281.



Cast of Cancerous Cavity of Cervix produced by chloride of zinc. (From specimen in possession of P. F. M.)

Dangers.—In using the curette the proximity of the peritoneum should be borne in mind, and the ease with which the soft cancerous tissue may be removed and the brittle peritoneum be perforated. If the accident is at once recognized and the operation suspended, the cavity being packed with iodoform gauze, probably no great damage will have been done. Occasionally a large blood-vessel may be opened by the curette and a severe arterial hemorrhage result, requiring the use of deep sutures or ligatures; but this is a very unusual occurrence. The chloride of zinc also is not without its dangers, since perforation of the uterine wall may be produced by a too thorough application of the pledgets and a too deep action of the caustic. Two such cases are reported by Sims in the article mentioned. We (P. F. M.) have seen one instance of perforation of the uterine wall, with collapse and death, after the careful use of the curette in the neighborhood of the os internum, followed by the tamponade with pledgets of cotton soaked in a solution of persulphate of iron in glycerin. In this connection we desire to warn against the use of the sharp curette and escharotics in the uterine cavity in cases where the disease is mostly supravaginal, chiefly on account of the danger of perforation just referred to.

Paquelin Thermo-cautery. — Instead of the chloride of zinc, or, if preferred, some hemostatic agent, such as persulphate of iron or tannin, the cavity excavated by the curette may be thoroughly seared with the ball tip of the Paquelin heated to a dull red heat. This should be done very carefully, gently, and so thoroughly as to check all bleeding and give the surface of the wound a black color. The cavity may then be packed with iodoform and tannin or iodoform gauze.

It is not always easy to accomplish the arrest of oozing with the Paquelin, and a very thorough application of the heat may be required to effect this purpose; and this very thorough application may produce a destruction of tissue, as a result of which a slough takes place which is deeper than the operator intends, and on the separation of which blood-vessels are opened from which a very profuse hemorrhage may occur. The Paquelin may also be used without being preceded by the curette in cases where the carcinomatous infiltration is flat and not excavated, the object being to destroy as much of the diseased tissue as possible.

Danger.—We formerly employed the Paquelin very frequently in these cases, but have had an unfortunate experience (P. F. M.), in which, after removing the epitheliomatous cervix with the galvano-cautery wire, we found it necessary to excavate the remaining portion of the cervix with the sharp curette. The Paquelin was then applied thoroughly and the patient tamponed. On removing these tampons on the second day, absolutely no hemorrhage took place; hence new tampons were but loosely inserted; but immediately after our departure the slough produced by the Paquelin in the vaginal vault broke down, a furious hemorrhage took place from the pampiniform plexus, which resisted all attempts at control by tamponade and pressure, and the patient died some twenty-four hours later. Dr. M. D. Mann of Buffalo relates an instance in which, after removing the cancerous cervix with the galvano-cautery wire, he found a small nodule of diseased tissue still present on one side of the cervix. This he excised with scissors, and thereby accidentally opened an artery of such size that, in spite of all his efforts to arrest the hemorrhage, the patient succumbed on the table. We do not quote this case as illustrative of sloughing after the Paquelin, but merely as an evidence of the profuse hemorrhage which may occur from the cervix in these cases and as a companion to our own unfortunate experience.

We would warn, therefore, against an indiscriminate and too deep application of the thermo-cautery, for fear of producing too extensive sloughing and possibly severe secondary hemorrhage. Furthermore, it has seemed to us that the stimulant action of heat tended at times to increase the rapidity of growth of the malignant disease; hence we confess that we prefer as a rule the chloride of zinc to the Paquelin cautery when we wish to produce a slough after curetting.

It will appear from what we have said above that, after removal of the diseased cervix by the galvano-cautery wire, it may still seem desirable or necessary to destroy as much of the diseased tissue as possible above the line of amputation with the curette, chloride of zinc, or Paquelin.

Nitric Acid.—In many cases of superficial carcinomatous ulceration of the vaginal portion of the cervix or of the cervical cavity, in which there is but little bleeding and only a serous, more or less offensive secretion, the latter may be kept in check and the raw surface incited to cicatrization by the free application of nitric acid once or twice a week, followed by packing with iodoform and tannin powder. We consider this a very useful treatment for those forms of incurable carcinoma in which the strong palliative remedies above mentioned are not required.

A still milder treatment for similar cases to those just mentioned is the introduction, every day or two, of some iodoform and tannin powder, kept in place by a tampon. By it the secretions are modified, controlled, and the growth of the disease materially checked. This iodoform and tannin may also be introduced by the patient herself in the shape of suppositories made up with cacao butter or gelatin, one or two being used each day according to the requirements.

Accidental hemorrhage occurring during this treatment, or at any time during the progress of a case of cancer of the cervix, may be checked almost invariably by packing the bleeding cavity with a tampon soaked in a solution of persulphate of iron in glycerin, equal parts, and squeezed dry, or the bleeding cavity may be filled with dry powdered persulphate of iron, held in place by one or more dry tampons. At times, in urgent cases, the ligation of the uterine arteries by deep silk or wire sutures passed through each vaginal vault may be required to check the bleeding, in addition to the above measures.

In addition to the perforation and hemorrhage which we have mentioned above, the possibility of the occurrence of peritonitis after any of the more powerful applications described should not be forgotten. As an instance of this kind we will refer to the case of sequestration of the whole of the body of the uterus reported by Mundé on p. 575.

Before concluding this chapter we desire to reiterate the impossibility of curing cancer of the uterus, as indeed of any other organ of the body, unless it is seen at a time so early that complete and absolute removal of the diseased tissue can be effected. Hence we think it our duty to impress upon the practitioner the advisability of counselling his patients and the laity in general of the importance of an early diagnosis of cancer, and therefore of the danger of neglecting to consult a competent physician whenever the salient symptoms of uterine disease manifest themselves. No menstrual period which lasts beyond the normal time, no bloody or offensive discharge from the vagina, no persistent pelvic pain, should be overlooked or considered unimportant; and chiefly do these remarks apply to that time of life—the so-called change of life—when these irregular, bloody, and serous secretions are supposed to be natural, but are found on a too late examination to be due to cancer, now passed entirely beyond more than palliative help. It is surely better that ninety-nine women should be examined and no cancer be found than that one with cancer should allow the examination to be deferred until too late.

Complications of Cancer with Other Tumors of the Sexual Organs.

Fibroids.—It was formerly supposed that cancerous and fibroid growths could not and did not develop in the same uterus. This, however, has been found to be erroneous, since many cases are on record—we ourselves having seen quite a number—where cancer of the cervix occurred at the same time with fibroid of the body; and there is no reason why this should not be the case, since the distance between the two neoplasms renders an entire different histological change perfectly allowable. The change of a fibroid to true cancer is, however, as yet questioned, although the sarcomatous degeneration of a fibroma or myoma has been repeatedly witnessed.

Ovarian Tumors.—There is no connection, of course, between a cancerous degeneration of any part of the uterus and the development of an ovarian tumor. It is only in regard to the question of operation that we propose to say a few words on the coexistence of these two affections. Cancer of the uterus, being by far the most important, as it is the most rapidly fatal, of the two diseases, requires our chief and first attention. If the cancerous uterus can be entirely removed, it should be done, the ovarian tumor either being extirpated through the vaginal incision at the same sitting, or, if too large, being removed by laparotomy before vaginal extirpation of the uterus; or if this appears inadvisable, the uterus may first be removed, and after convalescence the ovariotomy be performed. A number of cases are on record where vaginal hysterectomy and abdominal ovariotomy were performed at the same sitting with perfect success.

Cancer of the cervix complicated with pregnancy lies beyond the scope of this work, being in the domain of obstetrics. We will merely remark that if a cancer of the cervix be detected during the early months of pregnancy, it is usually advisable to remove the cancerous disease at once as thoroughly as possible, without reference to the presence or persistence of pregnancy. In the cases observed by us abortion soon followed the removal of the cancerous cervix, with the exception of one case referred to in this chapter, where the pregnancy went to term and the woman was, so far as we know, permanently cured. In the early months, up to the third or fourth, the removal of the whole uterus *per vaginam* has been performed a number of times.

CHAPTER XL.

DISORDERS OF MENSTRUATION.

THE process of menstruation, by which the human female discharges from the uterus a certain amount of blood once in every lunar month, depends upon three phenomena which are intimately connected: 1st, the spontaneous escape of one or more ovules from the ovaries; 2d, engorgement of the erectile vascular stratum surrounding and supplying the uterus; and, 3d, transudation of blood from the vessels supplying the endometrium.

Until the year 1821, when Power first broached the subject, the connection between ovulation and menstruation was unsuspected. Even then it was not established until the writings of Negrier in 1840. After this the investigations of Pouchet, Bischoff, Coste, and Raciborski carried conviction to the minds of most and caused the general acceptance of the theory.

Even to the present day the exact relation between ovulation and menstruation is still a matter of dispute. The generally accepted view of the case is, that the ripening and dehiscence or expulsion of ova are necessary to the inception of the first menstrual period, but that, once the ovaries having assumed their physiological function of preparing and discharging ova at certain intervals, the process of menstruation—that is, the monthly discharge of blood from the uterine mucous membrane and tubes—goes on more or less independently of the periodical ripening and expulsion of ova from the Graafian follicles. Thus the inception of the process of ovulation may be considered necessary to the inauguration of the menstrual function, but after that period both occur more or less independently of each other. That this view is correct, or at least has the greater weight of evidence in its favor, is proved by the undoubted discharge of ova from the Graafian follicles at other times than before, during, or immediately after the regular menstrual epoch, and even at times when menstruation is entirely absent, as during lactation or when amenorrhœa has for some reason or other existed for several months. That conception frequently takes place while menstruation is suppressed during lactation, and has even occurred before menstruation had ever appeared, is well known and cannot be disputed. In order that conception should occur under such conditions, ova must have been discharged from the ovary and received into the Fallopian tube; hence the occurrence of ovulation without menstruation in such cases is proved beyond a doubt. Further, after the removal of both ovaries and tubes the menstrual period has been known to occur with more or less regularity in many cases. We ourselves have found that this function has been maintained for a variable length of time in about 4 per cent. of our cases of removal of the ovaries and tubes. It is most probable that ova are discharged from the Graafian follicles at indefinite periods, such discharge being often hastened by some accidental excitement, chiefly of a sexual nature. Some authorities have advanced the theory that the ovum is expelled from the Graafian follicle usually just before the menstrual period or during the height of that function, and that conception, therefore, is most likely to occur soon after the cessation of menstruation. Loewenthal has proposed the hypothesis that the ovum reaches the uterine cavity unimpregnated—that if impregnated at this time menstruation does not occur, and the ovum settles itself in the new-formed mucous membrane prepared for the next menstrual period. If, however, impregnation does not take place, the ovum perishes, and its death causes an active congestion which is followed by a flow of blood—that is, the menstrual hemorrhage. This theory might explain those cases of impregnation just before an expected menstrual period, which then does not occur. These are the cases in which pregnancy is supposed to have gone beyond the natural limit of 280 days, since the reckoning was taken from the last menstrual period, whereas conception did not take place till about three weeks later. The probability of ovulation occurring between the menstrual periods, and indeed at almost any time under special excitement, explains the possibility of conception at almost any moment except during the existence of the menstrual flow.

Formerly it was believed that the superficial layers of the mucous membrane of the uterus, which membrane had become enormously hypertrophied, prior to the expected menstrual period underwent a process of fatty degeneration, and were exfoliated to a certain depth and regenerated after the cessation of the flow. In this manner the easy rupture of the weakened blood-vessels was explained; but later observations, particularly by Ruge and Moericke, show that intact ciliated epithelium exists on the mucous membrane of the menstruating uterus, and that, therefore, no fatty degeneration and desquamation of the epithelium of that membrane takes place. The discharge of blood must therefore be by the process of diapedesis or transudation without rupture of the vessels. We ourselves have seen this take place in an inverted uterus.

Menstruation ordinarily begins at the age of thirteen to fifteen, varying in different nations and climates, and continues with more or less regularity in perfect health every twenty-eight days during the entire childbearing life of the female—that is, up to about forty-five years—with the exception of the periods of pregnancy and lactation. The menstrual period lasts in health from three to five days usually, should physiologically be entirely devoid of pain or discomfort, and the amount of blood lost should in no way weaken or inconvenience the woman. Unfortunately, these physiological conditions under the strain of our present civilization are seldom met with. While menstruation not infrequently occurs during lactation, we ourselves cannot say that we have ever seen a case in which the regular occurrence of the menstrual flow took place for several months in succession during normal pregnancy. When such bloody discharges were reported to us during pregnancy, we have invariably found them to be due to some pathological condition of the cervix or body of the uterus, chiefly to the presence of a lacerated and eroded cervix or to an impending miscarriage, and usually the hemorrhages were irregular in their appearance, and not periodical like those of normal menstruation.

Just before and at the time of the normal menstrual period there exists a certain amount of vascular and nervous tension throughout the body, which manifests itself by certain feelings of malaise with which all physicians are familiar. These are more or less physiological, and mostly cease when the flow has been properly established. Before the appearance of the bloody discharge the breasts often swell, become tense, and in some cases lumps appear in them, which are simply the congested lobes of the gland, and must not be taken for tumors, since they usually disappear as soon as menstruation has fairly begun. There is also an increased hyperæmia of the pelvic organs, with more or less profuse secretion just before the menstrual period.

As already stated, the time of recurrence of normal menstruation is every twenty-eight days; many women, however, in perfect health menstruate a few days sooner or later, and accidental influences may either anticipate or postpone a menstrual period by a few days or a week. We (P. F. M.) have seen two cases, sisters, in whom the menstrual period, after being regular for a number of years, during which one of the ladies bore several children, for some reason ceased for a period of five and nine years respectively, both ladies being in perfect health; then reappeared, impregnation taking place in the one who had borne children before. We consider this a very unusual observation, and mention it merely to show how uncertain a factor the regularity of the menstrual discharge may occasionally be.

The menstrual blood is usually of a dark color and has a peculiarly unpleasant odor, probably due to the retention of the discharge in the uterus and vagina when the woman is in bed, and the decomposition of the blood by the acid secretions of the vagina. Many women mention the fact of their passing coagula as something unusual and worth recording. If such coagula are passed with pain, it means that the blood is retained in the uterine cavity and coagulates there until the organ expels it by contractions which cause the pain. This would indicate the probability of a constriction or flexion of the canal; but ordinarily menstrual coagula only mean the accumulation of blood in the vagina over night, where it naturally coagulates, and is expelled in the morning when the woman uses the vessel.

We have already said that apart from a certain feeling of general discomfort, pelvic weight and bearing down, and nervous irritability, normal menstruation should produce no special pain or discomfort. But, unfortunately, the function is by no means so normal, regular, and physiological as Nature had intended that it should be. This may be due to the high tension put upon the constitutions of our women by the requirements of our present civilization; by which we mean to convey, among the higher classes of our society, the pressure of social duties, the cares of housekeeping, the constant mental and physical strain upon the large majority of our city ladies; and in the lower and country population the necessity for hard work, often insufficient nourishment, together with the frequently recurring duties of maternity which the poorer classes seem for some mysterious reason particularly subject to.

Menopause.—The "change of life," climacteric, or menopause is the period when the function of menstruation, and usually also that of ovulation, ceases. The average duration of the childbearing period is thirty-three years, according to the investigations of Raciborski, and the average inception of the menopause is between the forty-fifth and forty-seventh years. Some women cease to menstruate as early as forty, and some go in perfect health beyond fifty. A certain hereditary disposition seems to be present in these cases, particularly those of late menopause. If the menopause occurs earlier than the fortieth year—and we have seen it as early as the twenty-sixth year—it is usually due to superinvolution and atrophy of the ovaries commonly following parturition, and is not a physiological event. The period of the menopause may extend over several years, menstruation gradually becoming more and more irregular, and finally ceasing entirely, or growing more profuse, skipping several months, and then reappearing, this process being repeated a certain number of times until finally the flow ceases, or it may occasionally stop suddenly. The more gradually the function ceases, the less the constitutional, chiefly nervous, disturbances; and the greater the irregularity of the disappearance of the menstrual flow, the greater also the hysterical, neurotic, and vascular disturbances in other parts of the body. Among the common symptoms of the menopause are hot flashes through the head and face, headaches, meteorism, irregular congestion of the skin of different parts of the body, feelings of numbness, and other neurotic disturbances of a similar nature. The mind may be affected at this time, either temporarily or even permanently, but as a rule all these disturbances gradually cease after the disappearance of menstruation and the patient soon returns to perfect health. The irregularity and uncertainty of amount of the bloody discharges during the months or years occupied by the change of life should not allow either the woman or the physician whom she may consult to be misled, and to attribute profuse irregular hemorrhages and other more or less remote mysterious symptoms entirely to this physiological period. We have already remarked that but too often the mistake is made of attributing such hemorrhages to the climacteric, when in reality they were due to rapidly progressing malignant disease of the uterus.

The common disturbances of the function of menstruation are—first, those in which it is entirely absent or suppressed for a time; second, those in which it recurs too frequently and profusely; third, in which it is associated with pain; fourth, in which it is accompanied by the discharge of a portion of the lining membrane of the uterus.

Amenorrhœa.

Definition.—Amenorrhœa, a term derived from *a*, privative, μήν, "a month," and ῥέω, "I flow," implies an absence of the menstrual flow in a woman in whom it should naturally exist. Such an absence before puberty, after the menopause, or during pregnancy and lactation is the normal condition, and hence does not come within the definition.

The absence of menstruation may be either temporary or permanent. In the first case it is called *suppressio mensium;* in the second, amenorrhœa.

SUPPRESSION OF MENSTRUATION may occur as the result of—

1. Pregnancy;
2. Exposure to cold during a menstrual period;
3. Some sudden mental or physical shock;
4. Rapidly-increasing obesity;
5. Luxurious living and want of exercise;
6. A serious illness or some wasting constitutional disease;
7. Discharge of blood from other organs of the body at more or less regular, periodical intervals.

1. *Pregnancy.*—The suppression of menstruation as a result of conception is a physiological condition, and need not be mentioned, except to inculcate upon the practitioner the necessity of assuring himself that in any case of cessation of menstruation which may come to his observation, that cessation may not be due to the existence of pregnancy. Irrespective of the statements of the patient, a careful bimanual examination of the size and outline of the uterus, together with inspection of the breasts, ought to suffice for a correct diagnosis.

2. *Exposure to Cold during a Menstrual Period.*—This is undoubtedly a very frequent cause of menstrual suppression, which usually lasts only a short time, and probably rarely extends over more than one menstrual period. In young girls it would not call for any special anxiety or treatment, usually taking care of itself at the advent of the next period; but such a suppression, if very violent, might readily result in the production of an acute endometritis or an acute inflammation of the tubes, ovaries, or peritoneum.

The treatment would consist in hot applications to the hypogastrium, warm sitz-baths, warm vaginal injections, sinapisms to the thighs and calves, saline laxatives, and the administration of binoxide of manganese in two-grain gelatin-coated pills, one or two after each meal until the flow is established. In married women it would be well to mistrust the history of suppression as the result of cold, since conception may very readily have taken place. Usually the binoxide of manganese does not exert an injurious effect upon an incipient pregnancy; still, we have reason to believe that it may possibly bring on miscarriage at a very early period, and we therefore counsel caution in its use in a doubtful case.

3. *Some Sudden Mental or Physical Shock* has often been known to check a present menstrual flow or prevent its appearance at one or more subsequent periods. Such shocks may be either of a pleasurable nature or the reverse.

Treatment is usually symptomatic, and, the possibility of pregnancy being eliminated, there is no haste in securing a reappearance of the function, which will usually return of its own accord in the course of time. If the non-appearance of menstruation should seem to cause mental or physical disturbance, the regular administration of the manganese pills above mentioned, continued during the whole intermenstrual period or for several months in succession, together with massage, exercise, chiefly equestrian, would be indicated. In married women the performance of the marital function will often result in a return of menstruation.

4. *Rapidly-increasing Obesity.*—There seems to be a mysterious relation between a rapid accumulation of adipose tissue in young women, mostly soon after marriage, and a diminution in amount of the flow, often associated with irregularity, lengthened intervals between the periods, and at times complete cessation for a number of months. This relation has been noticed by many writers, especially by those who have the opportunity to see women who come under treatment for the cure of general obesity. Sterility is almost invariably present in these cases. We have seen so many instances of this kind that we have arrived at the conclusion that the greater the amount of obesity in sterile women, the more pronounced is the irregularity and scantiness of menstruation, and to look upon the solution of the difficulty as depending not upon the re-establishment of a regular and normal menstrual flow so much as upon the diminution of the adipose tissue. If the latter can be done, the menstrual flow will usually resume its normal periodicity and abundance. It seems to us as though the nutritive energies of the body have become diverted mainly to the production of fat, to the detriment of the vascular and nervous supply normally directed to the sexual organs.

The treatment in such cases should aim first at a reduction of the obesity by diet, exercise, and saline laxatives (a cure at Marienbad, for instance), and second at a stimulation of the uterus and ovaries, chiefly by the local application of the faradic current. Both these courses of treatment may be carried on at the same time. Still, we believe that the first plan of treatment—that is, the reduction of general obesity—if successful, will usually result in a re-establishment of the normal menstrual function without any special local treatment. We (P. F. M.) have met with an instance where a woman soon after marriage became enormously stout, increasing from one hundred and twenty to two hundred and fifty pounds; menstruation became less and less regular and more and more scanty, until finally the lady would skip five or six months without a single sign of the menstrual flow or even a molimen. Of course she was sterile during all this time, which extended over a period of eight years. By means of a strict anti-fat regimen and the stimulation of the pelvic organs by the faradic current applied with the sound in the uterus, the sponge over the abdomen, three times a week for about six months, the woman's weight was reduced by at least fifty pounds, menstruation became regular, and conception soon took place. After a premature delivery from accidental causes the condition of obesity and menstrual suppression returned, but was cured by the resumption of the same treatment for several months, and conception again occurred.

5. *Luxurious Living and Want of Exercise* are common causes of temporary suppression of menstruation, and are therefore found mostly in the higher classes. The remedies are self-evident.

6. *A Serious Illness or some Wasting Constitutional Disease* may, through a depreciation of the vital forces caused by malnutrition and general anæmia, bring about a temporary suppression of menstruation. Thus, pelvic peritonitis, puerperal septicæmia, typhoid fever, pneumonia, pulmonary phthisis, general nervous prostration, chlorosis, etc. may have such a result. Of these diseases, chlorosis is one of the most common. It occurs in young girls approaching or entering the period of puberty, and consists in a general anæmia, due to a deficient supply of red corpuscles. It may continue for several years, and at times, instead of producing suppression of menstruation, may, by the weakening of the coats of the vessels and the thin character of the blood, be attended by too profuse menstruation. In either case the treatment will consist in endeavoring to improve the quality of the blood, chiefly by the administration of chalybeate tonics, together with such measures as will tend to build up the general health of the patient.

7. *Discharge of Blood from other Organs of the Body* at more or less regular periodical intervals. Occasionally a woman, instead of the regular monthly discharge from the uterus, loses at the same regular intervals a proportionate amount of blood from another organ, which discharge seems to take the place of normal menstruation. This is called *vicarious menstruation*. These periodical discharges of blood may take place from the rectum, the bladder, the lungs, the stomach, the nose (most frequently), or from certain portions of the skin (lips, fingers, nipples). This diversion of the normal menstrual flow does not seem to interfere with the health of the patients, nature appearing satisfied with the regular periodical abstraction of blood without reference to the organ from which it takes place. Still, such patients are dissatisfied with their condition and desire to be like other women.

Treatment should be directed toward stimulating the sexual organs to a proper performance of their functions, and the faradic current, applied as already indicated, will form the most potent agent for this purpose. Success, however, of such treatment is by no means assured.

The practitioner should be careful to study the nature of such cases thoroughly, in order not to mistake a hemorrhage from one of the above organs, occurring at regular intervals of four weeks, for possible disease of the rectum, stomach, lungs, etc.

Frequency.—With the exception of vicarious menstruation, all the above causes of the temporary suppression of menstruation occur very frequently, and are liable to be encountered by any physician who is engaged in general practice. Their nature and treatment should therefore be familiar to all the readers of this work.

IRREGULAR AND SCANTY MENSTRUATION.—Although not coming properly under the head of either partial or complete amenorrhœa, we think it worth while, on account of the great frequency of this form of disturbance of menstruation, to call attention to it in a separate section. By reference to the preceding pages it will be seen that mention has already been made of some of the causes to which gradually increasing irregularity and scantiness of the menstrual flow may be due, chief among which is that of obesity, mostly in young, recently-married women who at the same time are sterile. The peculiar relation between obesity and deficient ovulation and menstruation has there been pointed out. The health of the women in these cases is usually quite good, and they consult the physician more on account of irregularity and the sterility than because they have any decided complaint. Usually such women are anæmic, and general anæmia, whether attended with or depending upon any constitutional disease, is another very common cause of this particular form of menstrual disturbance.

The treatment of such cases will of course depend upon the removal of the cause, and has been outlined in a general manner in the preceding section.

AMENORRHŒA OR COMPLETE SUPPRESSION.—Complete absence of the menstrual function for a period exceeding one or more years may properly be considered as more than a temporary suppression, inasmuch as it usually depends upon some organic disease of the sexual organs or indicates the arrival of the menopause, whether premature or at its normal time. Complete amenorrhœa may result from the following pathological conditions of the generative organs:

Absence of uterus or ovaries;
Rudimentary uterus or ovaries;
Occlusion of uterus or vagina;
Uterine atrophy;
Pelvic peritonitis;
Atrophy of both ovaries;
Cystic degeneration of both ovaries;
Removal of both ovaries;
Removal of the uterus.

The absence of the uterus or ovaries is by no means so rare as has been supposed. We have seen a fair number of cases of entire absence of the ovary, although complete absence of the uterus is not quite so frequent, since even where the ovaries are entirely wanting a slight induration similar to an accumulation of a number of muscular or elastic fibres situated in the median line at about the middle of the pelvic cavity can be detected by careful bimanual examination through rectum and abdominal wall or bladder. While this indefinite little body can hardly be called a uterus, still, embryologically, it answers to that name. We (T. G. T.) have seen one instance, presented by the late Isaac E. Taylor to the Obstetrical Society of this city, in which no trace of the uterus could be detected upon the closest scrutiny of the parts removed post-mortem. A rudimentary condition of the uterus and ovaries is much more common, the uterus being merely a small solid body of the size of a filbert, the ovaries not larger than a bean and distinguishable only on careful bimanual examination *per rectum*; for in many of these cases the vagina is absent. We (P. F. M.) remember seeing such a case a few years ago at the New York Polyclinic in the person of a young buxom Irish girl twenty-one years of age, who presented herself because she had not yet menstruated. The external genital organs were perfectly normal, but there was entire absence of the vaginal canal. *Per rectum* and bladder a small uterus of the size mentioned could be felt, and indistinct traces of the ovaries. An artificial vagina was made for her, the uterus opened and sewed to the new canal, but under anæsthesia it was found that the ovaries were entirely too small to justify any hope of their being developed to functional activity by treatment.

Occlusion of the uterus or vagina may result in amenorrhœa for a number of months or even a year or more, the menstrual blood being secreted and retained within the imperforate canals. This condition has already been described under the heading of Atresia Vaginæ and Hematocolpos and Hematometra.

Uterine atrophy occasionally follows normal labor or abortion, or an operation on a lacerated cervix, or the removal of a uterine fibroid, or occasionally some form of wasting constitutional disease.

Atrophy of the uterus following abortion or labor at term is called superinvolution, and may occur almost at any time during the child-bearing life of the female.

Pelvic peritonitis may produce complete amenorrhœa by obstructing the discharge of ova from the Graafian follicles, and inducing gradual shrinking and atrophy of the ovaries through their compression by the contracting pelvic adhesions thrown about them.

A temporary suppression of menstruation, so frequently met with in the later stages of pelvic peritonitis, is not produced by this cause, being due to the general anæmia of the patients in protracted cases of this disease.

Atrophy of the ovaries may also be caused by certain febrile exanthematous diseases, such as typhoid fever, scarlatina, variola, measles, which bring about a shrinking of other glands of the body. Parotitis seems also to have such an effect by metastasis as it has on the testicles in the male. We (P. F. M.) remember having a lady of thirty-nine years under our care who had never menstruated, having experienced a severe attack of typhoid fever in her fifteenth year. The ovaries could be felt, but were obviously atrophied, and no menstrual molimen had ever been experienced.

Cystic degeneration of both ovaries, if very extensive in degree, might possibly produce complete amenorrhœa. Still, we have seen so many instances of double ovarian tumors where scarcely any vestige of normal ovarian tissue could be detected, either macroscopically or microscopically, after the removal of the tumors, and where menstruation persisted with perfect regularity, that we do not know where to draw the line between the complete destruction of normal ovarian substance and the persistence of more or less of its physiological elements in such cases. We (P. F. M.) have even seen one case of double dermoid tumors where nothing whatever of the normal tissue of the ovaries could be found, and still pregnancy in the fifth month existed.

Removal of both ovaries would seem to be sufficient to ensure the complete cessation of the menstrual flow, especially if, as is nowadays done universally, the tubes are at the same time ablated; but we have already mentioned that the menstrual function in a certain number of cases, about 4 per cent. in our experience, after double oöphorectomy continues for a variable length of time. This curious phenomenon has been differently explained, some claiming that it is due to a long-established habit of nature; others, that a small portion of one or the other ovary has accidentally been left behind; others, that the tubes were not entirely removed; others, finally, that a third or supplementary ovary existed and was overlooked. Which of these theories is correct we do not pretend to say, since either one of them may explain any given case. In our experience those cases have been most prone to this persistence of menstruation where the appendages were diseased and more or less adherent.

After removal of the uterus, the ovaries being left behind, menstruation may entirely disappear for a time, and then return from the vaginal cicatrix, the umbilicus, or some other portion of the body; or the ovaries may shrink and menstruation be permanently absent.

Significance of Amenorrhœa.—The significance of amenorrhœa depends more or less upon the cause. In the cases where the generative organs are congenitally absent or imperfectly developed, the absence of the menstrual function need not produce any unpleasant or detrimental effect whatever upon the patient, who may otherwise be perfectly developed and in robust health.

Retention of the menstrual blood by occlusion of the vagina or uterus will of course produce pains recurring at regular intervals, abdominal distension, and a corresponding amount of constitutional disturbance. The complete suppression of menstruation in cases where it has existed for a greater or lesser duration of time, and has become a well-established function, is, for a time at least, attended by unpleasant symptoms, particularly if more or less regular evidences of its attempted recurrence are present. Such symptoms are—frequent rushes of blood to the head, vertigo, hot flashes through the head, chest, and abdomen, nervousness, hysteria, hysterical and hystero-epileptic attacks. These are the symptoms which have been mentioned as often preceding and attending the normal change of life, and are similar to them in their causation and character. These symptoms are very commonly witnessed for some time—six months to a year or more—after the removal of the ovaries for disease of those organs or in order to bring about the early menopause.

Among the laity the impression prevails very largely that a temporary or complete suppression of the menstrual function is likely to produce some dangerous constitutional disease, such as chlorosis, phthisis, dropsy, nervous depression, etc. This is, however, by no means the case, since it is not the suppression of menstruation which is the cause of the evils feared, but entirely the reverse; the constitutional disease in the cases referred to being the cause for the menstrual suppression, which can only be removed by first curing the cause. The non-appearance of the menstrual function in girls of fifteen or sixteen years often alarms anxious mothers, but there is really no cause for such anxiety in the vast majority of cases, since even quite healthy girls do not always begin to menstruate at the usual physiological age of from thirteen to fifteen. Should the function be delayed until the twentieth year or even later, and absolutely no sign of its appearance manifest itself, it is not improbable that some defect in the development of the genital organs is present. We (P. F. M.) have seen during the past year two girls, one eighteen, the other twenty years of age, both perfectly developed, handsome, with well-formed external genital organs and apparently normal pelvic dimensions, but almost complete absence of the mammary glands, in whom both uterus and ovaries were practically absent, the vagina forming but a small blind pouch. Of course the true condition of such cases can be ascertained only by a local examination, the importance of which is emphasized by the case of two sisters (sic!) in Newark, N. J., who, having passed the twentieth year without any sign of the menstrual function, were finally, after years of thorough and manifold medicinal treatment by various practitioners, examined by one who suspected something wrong, and found to be hermaphrodites—that is, hypospadiac males.

The diagnosis of the causes of amenorrhœa, both incomplete and complete, should therefore not be made merely upon the statements of the patients or upon general symptoms, but always on the basis of a careful local examination, if necessary under anæsthesia. Examination not only *per vaginam*, but also with the finger in the rectum and the sound in the bladder, aided by the hand on the abdomen, may often be required to arrive at the precise condition of the internal genital organs.

Treatment.—The treatment of complete amenorrhœa depends entirely upon the nature of the cause of the affection. Absent or rudimentary uterus and ovaries are entirely beyond the reach of our therapeutical resources, with the exception of such cases of rudimentary uterus and ovaries in which the organs are at least developed to two-thirds their normal size at puberty. Then an attempt may be made by repeatedly dilating the uterus with tupelo or laminaria tents, stimulating its cavity by applications of carbolic acid and by the intra-uterine and abdominal use of the faradic current every other day during a number of weeks or months to incite both uterus and ovaries to an increased development. If molimina of more or less regularity exist, some success may be expected from this treatment, but if the ovarian function is absolutely dormant, this or any other kind of treatment will usually end in failure. Of course, in addition to local stimulation the circulation of the body should be aided by massage, walking, horseback exercise (other circumstances permitting), iron, strychnine, phosphorus in well-borne combinations, sea-bathing, gymnastics, nourishing food, chiefly meat and milk diet, regulation of constipation, etc. Marriage has been recommended as a stimulant to the dormant sexual organs, and if likely to prove successful would undoubtedly be a very proper course to advise; but should it prove unsuccessful, both parties would be left worse off than if they had not married. It is therefore, in our opinion, generally too risky, because too uncertain a plan to follow.

Occlusion of uterus or vagina is to be treated on the surgical principles laid down in the respective chapter.

Uterine atrophy, if not of too great an extent—that is to say, if the uterus does not measure less than two inches—may possibly be overcome by the same local stimulant treatment mentioned above. It will depend upon the individual case and upon the persistence of the function of ovulation, as shown by the menstrual molimina, whether it is worth while to subject the patient to a prolonged course of the necessary treatment.

When in these cases of complete amenorrhœa dependent upon atrophic uterus or dormant ovaries a certain amount of pelvic hyperæmia appears to exist, this may be increased, and possibly thereby the menstrual function induced, by cupping or scarifying the cervix uteri at repeated intervals, usually several times during the month, and chiefly every four weeks at the time when a menstrual molimen makes its appearance. The abstraction of a small amount of blood in this manner, by unloading the distended vessels, seems to induce a fresh determination of blood to the pelvis, and at times this is followed by what appears to be a more or less normal menstrual flow. The cupping may be performed by scarifying, and then applying a hollow tube with a suction pump made for this purpose to the cervix. Further, in cases where electricity cannot be employed frequently, an intra-uterine stem composed of alternate beads of zinc and copper may be introduced into the uterus and worn for several months, for the purpose of exerting a galvanic action upon the organ and stimulating it to increased growth. Very good reports have been given of this last-mentioned method of treatment; but it, like all others, will be productive of benefit only in cases where the ovulation, although dormant, still persists.

Compression or atrophy of the ovaries produced by their being imbedded in pelvic exudations following pelvic peritonitis is usually beyond our reach. Only in the earlier cases may appropriate local treatment, by means of iodine to the vaginal vault, glycerin tampons, hot douches, salt and brine injections, sitz-baths, and local galvanism, perhaps gradually produce absorption of the exudation, and set the ovarian surface sufficiently free to permit of the discharge of ova and the normal development of the organ. In old cases absolutely nothing can be done to effect a cure.

Cystic degeneration of the ovaries is likewise beyond our reach, so far as any treatment for the relief of the amenorrhœa goes. The removal of the diseased organs will, of course, only confirm the amenorrhœa.

MENORRHAGIA AND METRORRHAGIA.

Definition—The first of these terms is employed for the designation of a profuse and excessive flow of blood at the menstrual periods; the second for any flow of blood, whether profuse or not, during the intervals. A patient who menstruates too profusely is said to suffer from menorrhagia, while one who loses blood not only at menstrual periods, but in the intervals, is said to suffer from metrorrhagia.

Frequency.—Both these conditions are necessarily frequent, for they are symptomatic of a large number of functional and organic affections of the uterus. The uterus is the only organ in the body from which blood flows as a physiological process. Many organs and all the erectile tissues are subject to normal congestions, but from none except the uterus is a flow of blood ever other than a morbid process. It is not, then, astonishing that in this organ slight and numerous causes are apt to excite hemorrhage.

Pathology.—First, any condition which induces a state of active or passive congestion of the uterine parenchyma or lining membrane; second, any influence creating a solution of continuity upon its mucous surface; third, any growth which, having a vascular connection with the uterine vessels, allows of a percolation through its tissues and from its circumference; and fourth, any agency producing dyscrasia of the blood,—may result in these disorders. Any one of these conditions existing alone may produce the flow; several combined are still more certain to do so. It must, however, be admitted that very violent hemorrhages will sometimes take place from the non-pregnant uterus without our being able to determine their cause, none of the conditions just mentioned being recognizable.

Causes.—The conditions which most frequently occasion menorrhagia and metrorrhagia are—

Menorrhagia.

General plethora;
Fungous degeneration of uterine mucous membrane;
Subinvolution;
Fibrous tumors;
Chronic oöphoritis;
Retro-displacements of the uterus;
Fecal impaction;
Hepatic, renal, and cardiac disease;
Leucocythæmia and hæmophilia.

Metrorrhagia.

Polypus;
Cancer or sarcoma;
Retained products of conception;
Hematocele;
Acute pelvic cellulitis and peritonitis;
Lacerated cervix.

Menorrhagia.

General Plethora.—Full-blooded women who live well, do not take sufficient exercise, and perhaps even indulge more or less in alcoholic stimulants, are very liable to profuse menstruation. They are usually also habitually constipated, and their portal circulation is therefore not only overcrowded by the introduction of new matter, but not relieved by a regular evacuation of the bowels; hence the pelvic organs are congested and uterine hyperæmia exists, which is intensified at the time of the menstrual epoch.

Fungous Degeneration of Uterine Mucous Membrane.—We have already discussed this subject in a separate chapter. It may be said to be one of the most frequent causes of profuse menstruation, usually as a result of chronic uterine congestion, commonly associated with catarrhal endometritis. The diagnosis is easily made by the curette, and the treatment carried out and cure effected by a more thorough employment of the same instrument.

Subinvolution.—Following abortions and confinements at term, when the labor has been unusually rapid or unusually slow, a proper involution of the uterus very frequently does not take place; the organ remains hyperæmic, enlarged, soft, and the blood-vessels are usually dilated. Hence when the menstrual congestion occurs a profuse flow is the result. When the subinvolution has gradually merged into its second and chronic stage, generally known as hyperplasia, the profuse menstrual flow usually ceases, and even scanty menstruation may take its place.

Fibrous Tumors.—The characteristic symptom of uterine fibroids of the interstitial and submucous variety is to induce an increase of the menstrual flow. Menstruation recurs regularly every four weeks, but may last nearly the whole intermenstrual period, the patient being free from discharge only for a week or less during the month. Intermenstrual discharges of blood do not usually occur unless the fibroid has become a polypus.

Chronic Oöphoritis.—In chronic inflammation of the ovaries, which really means a chronic congestion of those organs, the additional vascular tension occurring physiologically at each menstrual period is liable to induce a hyperæmia of the uterus which results in a profuse menstrual flow. This result is, however, not by any means invariable.

Retro-displacements of the Uterus, if associated with congestion of the organ, are liable to provoke menorrhagia. Not infrequently, however, a fungous degeneration of the endometrium exists in these cases.

Fecal Impaction.—Aggravated degrees of this condition can undoubtedly, by obstructing the pelvic circulation, bring about such a condition of venous hyperæmia in the pelvis as to excite a more than usually strong flow from the uterus at the menstrual period. While women are habitually constipated, it is but rare that such a degree of fecal impaction is observed; still, the possibility of its occurrence should be borne in mind when seeking for an explanation of an apparently mysterious menorrhagia.

Hepatic, Renal, and Cardiac Disease will, by interfering with the return of the venous blood to the heart, produce congestion of the veins of the whole body, and therefore also of the pelvis: hence the tendency to menorrhagia.

Leucocythæmia and Hæmophilia.—In these diseases the number of white blood-corpuscles is so much greater than that of the red that the blood loses its normal property of ready coagulation, and any injury to blood-vessels is liable to be followed by a profuse hemorrhage. These diseases, fortunately, are not very common. They may be recognized by a careful inquiry into the previous history as to the tendency to hemorrhages from slight injuries, and by the discovery of an enlarged spleen, liver, or lymphatic glands.

Metrorrhagia.

Polypus.—A uterine fibroid which has become polypoid will invariably excite more or less copious discharges of blood from the uterus at irregular intervals—that is, both at and between the menstrual periods.

Cancer or Sarcoma.—The same applies to these diseases, since the profuse hemorrhages which they induce may occur at any moment, day or night, walking or sitting, without premonitory warning.

Retained Products of Conception.—Hemorrhage from this source is most liable to occur very soon after the discharge of the first part of the ovum, but it may take place at any time during a period varying from several hours to a number of weeks after the miscarriage. The history of the case should be carefully inquired into, and the statements of the patient as to the complete discharge of the ovum accepted with reservation until the examining finger satisfies itself, by finding the external os closed and the uterus normal in size, that its cavity is empty. Should the uterine canal be impassable for the finger, and still hemorrhage continue, dilatation by a tupelo tent and the use of the curette may show the presence of small fungoid growths at the placental site, which are probably the result of a subacute endometritis which has existed without any assignable cause. The removal of these growths with the curette will usually arrest the hemorrhage and cause the uterus to contract.

Hematocele.—A bloody discharge from the uterus as a consequence of an effusion of blood into the pelvic cellular tissue or the pelvic peritoneum is merely a sign of the general pelvic hyperæmia which exists in such conditions. It may mean rupture of a tubal pregnancy, or the hematocele may be due only to rupture of some varicose vessels in the pelvic cavity.

Acute Pelvic Cellulitis and Peritonitis.—The occurrence of a bloody discharge from the uterus during this disease is very common, and is merely an evidence of the general pelvic congestion natural to this condition. It appears an effort of nature to relieve the hyperæmia, and is usually of no consequence. We can remember but one case where it was necessary for us to tampon the vagina in order to arrest the hemorrhage accompanying acute pelvic inflammation.

Lacerated Cervix.—If there is much eversion, erosion, and papillary hyperplasia of a lacerated cervix, a bloody discharge, sometimes quite profuse, is liable to occur at any time, especially after coition, digital examination, or some special exertion. It is not usually very severe, and consists more in a so-called spotting than in an actual hemorrhage.

Differentiation.—This is at once the most important and most difficult of the physician's duties in reference to the symptoms which we are considering. If he be too easily persuaded to look upon the loss as one of the results of the "change of life" or even of primary idiopathic congestion, much time may be lost before his error is corrected. Should he forget that he is dealing with a symptom, and look upon the condition as a disease, he will often not merely lose time, but in the end entirely fail in giving relief; for the empirical practice of confining such patients to bed and relying upon astringents, cold applications, and narcotics will commonly be found to be ineffectual. In every case, unless the cause be palpable, it is advisable to examine systematically the entire uterus and its surrounding tissues in the following manner:

1st. The cervix should be investigated by touch, the speculum, and the uterine probe.

2d. The anterior and posterior walls and the fundus and sides of the uterus should be examined by conjoined manipulation, rectal touch, and palpation.

3d. The whole pelvis should be explored by conjoined manipulation, rectal touch, and palpation.

4th. The cervix should be dilated by tents, and the cavity of the body explored by the introduction of the index finger, by the uterine sound, and the curette.

In many instances a diagnosis can be made only by these means, but by their aid, if fully developed, very few cases will baffle research.

Tents offer us a most valuable means for diagnosis and treatment, but the practitioner must be very sure to open the os internum by them so that the finger may pass to the fundus. In many cases, when it is supposed that a full investigation of the uterine cavity has been made, the os internum has never been passed by the finger, which consequently explores only the cervical canal. It will not infrequently require three and even four tents to open the cavity of the body fully to the finger. But such an exploration, although very thorough and satisfactory, is not free from danger. It may therefore be very generally replaced by the passage of a loop of wire over the endometrium. If any small tumor exists, it will in this way be discovered, and if uterine fungosities exist, the removal of one or more will very surely disclose the fact.

Prognosis.—This will depend upon the cause of the affection. Should this be clearly ascertainable and curable, it will of course differ very much from what it would be if the cause were obscure and difficult of removal.

Results.—Menorrhagia and metrorrhagia, being but symptoms of the pathological conditions mentioned above, will produce results entirely in proportion to the nature, severity, and curability or incurability of those conditions. Thus sterility, anæmia, general anasarca, extreme emaciation, hysteria, neurasthenia, and even death, may result in consequence of the profuse bloody discharge; but we should always remember that this is merely a symptom, and that the true cause of the result is to be sought in the primary disease.

Treatment.—This is either palliative or curative. If possible, the cause of the hemorrhage should be ascertained at once after seeing the patient. This should be done with the least possible delay, and only in cases where the life of the patient is not in immediate danger. The cause discovered (such as, for instance, retained product of conception, a fibroid polypus, fungous endometritis), it should be removed with the utmost despatch; but if the necessary instruments should not be at hand for this purpose, or if the cause of the bleeding proves to be of a nature in which only palliative remedies can be applied, our first effort should be to stop the hemorrhage by the most thorough and convenient means at our disposal. In no case should we forget that it is the hemorrhage for which we were called in, and which is the prominent symptom in the case, and that it is our first duty to stop it at any cost—if possible by removal of its cause, but, if that be impracticable at the time, by the most efficient means which we may happen to have at our command. We would therefore always recommend a rapid, careful, and thorough digital examination in order to elicit the cause of the bleeding, which if found should be at once removed if possible; but if not for some reason, we should endeavor to check the bleeding by a systematic and efficient tamponade of the vagina, or if necessary even of the uterine cavity, the very best agent for which is iodoform gauze, the advantage of which over the old tampons of cotton soaked in a solution of carbolic acid or covered with alum is that it acts equally well as a hemostatic, and can be left in place for several days without the slightest danger of its becoming offensive or septic. As it can be procured in any drug-store at a moment's notice, and should indeed be a part of the armamentarium of every general practitioner, not to mention the gynecological specialist, there never need be any delay in employing this method. The utero-vaginal tamponade is by all odds the most effective means of arresting a hemorrhage from those organs. In addition, an ice-bag should be put upon the abdomen, the patient kept scrupulously quiet, and hemostatics, such as fluid extract of ergot in fifteen-drop doses every two or three hours, fluid extract of hydrastis canadensis thirty drops every three hours, or a mixture of tincture of digitalis and tincture of cannabis indica ten drops of each every three hours (all of these *pro re nata*), should be given. In the milder cases of either menorrhagia or metrorrhagia it may not be necessary to resort to quite such vigorous measures; especially does this apply to menorrhagia, where the administration of the internal remedies mentioned without the vaginal examination or tamponade may suffice. We would, however, call attention to the universal rule that in the absence of a physical examination of the parts from which the bleeding comes we are working in the dark, and may overlook the actual cause of the bleeding, and thus neglect to employ the only means of permanently arresting it. We have repeatedly met with cases of uterine polypi, of carcinoma of the cervix, and of fibroids of the body of the organ in which no symptom whatever was present from which we could hazard even a guess as to the true cause of the hemorrhage.

Occasionally, the source of the hemorrhage in metrorrhagia must be sought for through a speculum, in preference to or before making a digital examination. For instance, in two cases of dangerous bleeding from ruptured hymen and vaginal wall, caused by first coition, only after inserting the Sims speculum and emptying the vagina of the coagula which filled it could we discover the location of the rent (P. F. M.).

In cases of bleeding from a lacerated or cancerous cervix, local hemostasis by tampons covered with alum or persulphate of iron or tannin should be employed. It should be remembered that a tampon of tannin should not be placed upon a tampon saturated in a solution of persulphate of iron, since the combination of the two chemicals will result in the formation of ink—neither a useful nor an æsthetic agent in such a condition.

For menorrhagia which does not depend upon any organic uterine disease, such as villous endometritis or fibroid tumors, the employment of ergot in combination with iron during the intermenstrual period acts very happily in controlling the bleeding, while at the same time supplying to the blood the metallic ingredient of which it is in need. To give iron alone in menorrhagia with the view of building up the general health of the patient seems theoretically perfectly proper, but practically it results in increasing the amount of blood which will simply be lost at the next period; hence what the patient gains between the periods is sacrificed during the flow. By this combination of iron and ergot we believe that to a certain degree this drawback is avoided, the ergot seeming to contract both the uterine and vascular tissues.

Before assuming that a case of profuse menstruation is really one of true menorrhagia, the point must be considered that some women naturally menstruate very much more profusely than others, and that what to one would be an almost debilitating flow is to another merely a normal menstrual discharge. If a woman informs us that she has during all her menstrual life used from two to five napkins a day during six or seven days, and we find her to be full-blooded, robust, and in every way healthy, we should not consider this otherwise decidedly profuse flow to be pathological. If, on the other hand, a small, slender, anæmic-looking woman should give us a similar history, we would be justified in assuming that she was losing a great deal more than nature intended she should, and that it was our duty to discover and remove the cause of the profuse flow.

In cases of profuse menstruation which could not be controlled by the remedies, general and local, above mentioned, we have found it necessary to check the bleeding when we thought the woman had lost as much as she could spare by tamponing the vagina at each menstrual period for a number of months. Dr. Gehrung of St. Louis recently published an article advocating this practice; but we had employed it independently long before the appearance of his article. This method should not be considered an interference with a natural function, since it is used only when that function oversteps the bound prescribed by nature.

We have already referred to the fact that the persistence of a bloody flow from the uterus at *regular* intervals of four weeks during pregnancy is to us a matter of considerable doubt. Irregular discharges of blood, however—that is, metrorrhagia—to a more or less pronounced degree occur very frequently, and are usually due to some local lesion of the cervix or cervical canal, such as laceration, erosion, or cervical catarrh. Before proceeding to the local or general remedies above mentioned it would be well to assure ourselves of the existence or absence of pregnancy in doubtful cases.

Curative Treatment.—One great reason for the fact that this often proves fruitless is that the existing disorder, and not the disease which produces it, is kept before the mind of the practitioner. It should be borne in mind that the excessive hemorrhage is a symptom, and that the morbid state which creates it must be sought for and eradicated. We are confident that the statement already made, that one of four great pathological factors will usually be found to be the source of excessive or prolonged uterine hemorrhage, will stand the test of experience at the bedside. We therefore place before the reader at a glance the ordinary causes of uterine congestion, solution of continuity, growths from uterine mucous surface, and blood dyscrasia. That there are other conditions, such as pelvic peritonitis, hematocele, etc., which may cause uterine hemorrhage, we do not deny; but when a bloody flow marks the existence of such grave diseases, it is overshadowed by them and requires no special treatment. We here give those which ordinarily produce a flow which requires treatment from its prominence and importance, although we are almost repeating ourselves:

Congestion of uterine tissue may be due to	Areolar hyperplasia; Subinvolution; Fibroids; General plethora; Displacement; Fecal impaction; Chronic ovaritis; Laceration of the cervix.
Solution of continuity may be created by	Ulceration; Granular degeneration; Cancer; Sarcoma; Laceration of the cervix.
Growths from uterine walls may consist in	Polypi; Fungous growths; Adhering products of conception; Fibroids; Sarcoma or cancer.
Blood dyscrasia may be due to	Scorbutus; Chlorosis; Spanæmia from uræmia or other grave constitutional disease.

If the source of the disorder be discovered, its treatment is often very simple and effectual, and as the management of most of the conditions here recorded is familiar to every reader upon general medicine or is given in other parts of this work, little more need be said except upon one or two points.

In a case of subinvolution the free use of ergot will be found a valuable adjuvant to the means already enumerated for palliative treatment, and it may prove serviceable as a curative agent. The same remark applies to the fluid extract of hydrastis canadensis, which may be well employed alternately with, or instead of, ergot. In the treatment of all uterine congestions the occasional use of an active purgative or the systematic and steady employment of the same class of medicines in small doses will often prove highly beneficial.

Treatment of Fungous Degeneration of the Uterine Mucous Membrane.—If this condition be clearly diagnosticated, not surmised, but fully determined upon by rational and physical signs, the first consisting in prolonged hemorrhage, without the existence of other disease, and the second in evidence afforded by the detachment or expulsion of some of these masses, the whole lining membrane of the uterine body should be thoroughly but gently scraped by the curette represented in Fig. 156.

Should the cervical canal be narrow, it may be necessary to dilate it by a sea-tangle or tupelo tent; but ordinarily no previous dilatation is necessary for the use of this instrument, which should be passed with a slight degree of scraping action over the entire surface of the uterine body.

For a complete description of the use of the curette in uterine hemorrhage and the necessary after-treatment we refer to the chapter on Uterine Fungosities.

In place of the curette the lining membrane of the uterine body may be modified by the application of pure nitric acid, after the plan of Kidd and Athill of Dublin, or by the injection of the uterine cavity by pure tincture of iodine, solution of nitrate of silver, or solution of persulphate of iron diluted with two or three equivalents of water. As a full discussion as to the dangers of intra-uterine injections will be found elsewhere, we shall not enter upon the subject here.

Should caustic treatment by strong acid be determined upon, the cervical canal and internal os should be well dilated, so as to prevent the acid from being wasted before it reaches the lining membrane of the body.

In many cases replacement and support of a displaced uterus will serve to relieve a prolonged metrorrhagia, while the same results will be produced in others by cure of a granular and bleeding cervix or the repair of a lacerated one.

All disorder of the blood should be combated by appropriate constitutional means, even where it is secondary to the loss and not a primary cause of it. Where the hemorrhage is due to a polypus, the resulting impoverishment of the blood renders escape of the vital fluid more easy and rapid.

In very obstinate cases a change from a warm to a cold climate and from the lowlands to a mountainous region often accomplishes a great deal of good.

Dysmenorrhœa.

As already stated, normal physiological menstruation is unattended by pain or marked discomfort of any kind. A sensation of fulness in the pelvis, slight pain or aching in the back and loins, and a general feeling of irritability are the usual signs of approaching menstruation. But when any abnormal condition exists, either in the structures from which the blood pours into the uterus, in any of the surrounding parts or organs which undergo congestion during the menstrual epoch, or in the canal by which the blood passes into the vagina, menstruation may become exceedingly painful, and even undermine the health of the sufferer. This state receives the name of "dysmenorrhœa," a name derived from *δυς*, difficult, *μην*, a month, and *ρεω*, I flow.

Pathology.—Any condition, whether general or local, affecting the structure of the uterine walls, the ovaries, or the surrounding areolar or serous tissues, so as to render the nerves supplying these parts morbidly sensitive, may produce pain in connection with the first part of the process. Anything impeding the escape of blood from the uterus or vagina may produce it by interference with the second part. For example, a general condition resulting in neuralgia of the uterine or pelvic nerves, or a local inflammation altering their state, might readily create pain in the first stage, while either a natural or acquired stricture of the cervix would probably do so in the second.

As a general rule, dysmenorrhœa is due to one or more of the three following factors: 1st, a depreciated condition of the constitution, beginning usually either in the nervous system or blood, which creates a tendency to neuralgia; 2d, an abnormal state of the uterus; or 3d, a diseased state of the ovaries. In a woman in whom the nervous system, the uterus, and the ovaries are normal it is highly improbable that this condition would ever arise. Every practitioner can recall numerous instances in which any one of the three conditions mentioned had sufficed to establish it, and, as this is true of each of them separately, it is more so of a combination of the three.

Every case should be examined from this standpoint in practice, and the treatment adopted should be governed by the discovery of the existence of one or more of these conditions as causative agents.

Varieties of Dysmenorrhœa.—For convenience of study, dysmenorrhœa may be divided into the following varieties:

Neuralgic dysmenorrhœa;
Congestive or inflammatory dysmenorrhœa;
Obstructive dysmenorrhœa;
Membranous "
Ovarian "

Seat of Pain in Dysmenorrhœa.—Upon this point our knowledge is not certain. It is probable that in the first three varieties the pain is seated in the uterus, in the ovaries, or in the cellular tissue or peritoneum surrounding the pelvic viscera. Some of the most intractable cases with which we have met have been due to pelvic peritonitis, which, even after inflammatory action has subsided, has left the nerves supplying these parts in so sensitive a state that pain, or even a recrudescence of inflammation styled menstrual pelvic peritonitis, is excited in them by the process of menstrual congestion. It is often very difficult to decide as to the exact seat of pain. Even a physical exploration instituted during the menstrual period may fail to enlighten us.

The practitioner who regards dysmenorrhœa as a disease, and applies to every case a uniform plan of treatment, will rarely meet with success in its management. He should view it as a symptom of an abnormal condition which should, as far as possible, be discovered and removed. Although, even when acting thus, cases will be met with in which he will be baffled, it will be gratifying to perceive how rarely these will occur. The great importance of differentiating the varieties mentioned and adopting appropriate plans of treatment calls for a separate study of each.

NEURALGIC DYSMENORRHŒA.—This variety depends upon no appreciable organic disorder of the uterus or its appendages, but merely upon a peculiar state of the nerves, which, under the stimulating influence of congestion, produces pain.

Causes.—There are many agencies which at times so alter the healthy state of the nerves of the stomach as to produce in them, at each period of digestion, pain, which is called gastralgia or gastrodynia. Similar agencies may occasion neuralgia of the nerves of the eye or of those supplying the tissues of the head and face. In like manner they may affect the uterine nerves whenever these are inordinately excited from menstrual congestion. The same patient who from slight excitement or fatigue develops supraorbital neuralgia will often, from the same causes, suffer from neuralgic dysmenorrhœa.

The causes which generally induce it are—

The neuralgic diathesis;
Hysteria;
Chlorosis or plethora;
Certain blood-states, as those of malaria, gout, and rheumatism;
Luxurious and enervating habits;
Habits deteriorating the nervous systsm, as onanism or excessive venery.

Symptoms.—Pain may show itself before the flow has been established, and disappear as soon as it comes on, or it may continue with varying intensity throughout the duration of the menstrual discharge. The patient usually complains of a sharp, fixed pain over the pelvis, down the loins, or in some distant part of the body. We once saw a patient who during each period suffered intensely from neuralgic pain on the outer side of one little finger, and another who before the flow was established experienced for several days a violent pain at the root of the nose.

In some cases the pain seizes the patient very suddenly, and becomes so agonizing in character as to render her almost delirious. She will toss wildly upon her bed and give evidence of the most severe physical suffering. Then in a few hours the pain will almost as suddenly abate, and for the rest of the menstrual period exist only in very moderate degree.

Differentiation.—When the pain is felt in the uterus it presents nothing expulsive in its character; the flow of blood is steady and not interrupted; no clots are discharged by spasmodic efforts; and physical examination discovers no obstruction. These facts generally distinguish neuralgic from obstructive dysmenorrhœa, though sometimes differentiation is very difficult.

From the congestive form it is differentiated by absence of constitutional disturbance and by its being habitual and not exceptional. It may be distinguished from the inflammatory variety by absence of the ordinary signs of endometritis and of ovarian and peri-uterine inflammation. There is also absence of leucorrhœa and pain, as well as of the physical signs of inflammation, in the intervals of menstruation.

Prognosis.—If a patient affected by neuralgic dysmenorrhœa be able and willing to effect a decided alteration in her mode of life, the prospect of recovery is good. Should no such change be attainable, it is decidedly unfavorable.

Treatment.—The first duty of the physician should be to discover the cause of the development of neuralgia in the performance of the menstrual function, and the second to endeavor to remove this. Neuralgia of the face and head is rarely a primary affection, and consequently resists remedies directed especially to it. It generally results from some focus of irritation—as, for example, a decayed tooth, or a plug of hard wax in the ear, or from some toxic element in the blood—and when the cause is removed it disappears. So with the disorder which we are considering. If the rheumatic or gouty diathesis exist, it should be treated by colchicum, guaiac, and vapor baths. The skin should be kept warm and active by wearing flannel over the whole body in winter, and a mild, equable climate should be chosen during the cold months of the year. Should a delicate state of the nervous system have been engendered by habits of luxury, indolence, or dissipation, the patient should be sent to the country, where an out-of-door life, horseback exercise, early hours of retiring, and plain, wholesome food may exert a decidedly alterative influence. Chlorosis and plethora should be treated, the one by ferruginous and nervous tonics, fresh air, food, and cheerful surroundings; the other by strict diet, venesection, cathartics, and other depletory means. Malarial toxæmia should be treated by change of residence, quinine, and iron. A sea-voyage will often accomplish an excellent result in neuralgic dysmenorrhœa by its alterative influence, whatever be the cause of the neuralgic state; and the same may be said of surf-bathing.

In addition to these general means, benefit may be obtained from the use of some which are local. The occasional passage to the fundus of the uterus of a uterine sound, the retention *in utero* of the galvanic pessary—which has been described when speaking of amenorrhœa—the use of tents, and the systematic employment of the continuous or galvanic current, one pole over the sacrum or against the cervix, and the other over the hypogastrium, will often prove very serviceable.

Parturition often accomplishes an excellent result, and in many cases cures the affection entirely.

Besides these means there are certain anti-neuralgic remedies which act more or less as specifics in this form of dysmenorrhœa. Foremost amongst these is apiol, a yellowish, oily substance obtained from the *Petroselinum sativum* by the action of alcohol and filtration with animal charcoal. It is in the form of capsules, each containing five drops. The dose of these is one capsule night and morning one week before and during menstruation. The mother tincture of pulsatilla, five drops in water three or four times a day, given during the week preceding menstruation only, has done excellent service in our hands in many of these cases. Antipyrine and phenacetin, in ten- to fifteen-grain doses, two or three times daily as required, also relieve the pain in this variety of dysmenorrhœa. The tincture of cannabis indica, in doses of twenty-five drops every four hours while pain is severe, is also beneficial, as is also the hydrate of chloral in ten-grain doses every eight hours. Where a spasmodic element appears to exist in addition to the neuralgic, suppositories of butter of cacao, containing each a quarter of a grain of extract of belladonna, will often give great relief; they should not be repeated oftener than once in every eight hours. Under these circumstances, too, great benefit will often follow the use of enemata of tincture of asafœtida, two to three drachms in a gill of warm water, or of ten-grain doses of chloral dissolved in half a pint of warm gruel. Placing the patient in a very warm general bath for from twenty to thirty minutes is likewise often productive of great relief.

CONGESTIVE OR INFLAMMATORY DYSMENORRHŒA.—*Definition.*—At each menstrual epoch an active congestion occurs in the mucous membranes of the Fallopian tubes and uterus, as well as in the ovaries, and probably to a less degree in all the pelvic tissues. When any abnormal influence renders this excessive, it naturally produces pain in the nerves intervening between the distended vessels. This excessive hyperæmia, which may result from a mechanical cause, as displacement of the uterus, or from a vital cause, as the peculiar condition which we know as inflammation, gives rise to a variety of painful menstruation which has been styled congestive or inflammatory.

The state of inflammation which so alters the condition of the nerves immediately affected by ovulation or menstruation may exist in or around the uterus, in the peritoneum covering it, in the ligaments which sustain it, or in the areolar tissue of the pelvis.

In a great many cases inflammation of the uterine mucous membrane is the cause of this form of dysmenorrhœa. The existence of disease in this part causes, perhaps, little pain until the erethism engendered by menstruation occurs. Then great local excitement takes place and dysmenorrhœa shows itself.

Causes.—It may result from almost any pelvic inflammation or from any influence which exaggerates and prolongs the congestion excited by ovulation. Chief among these may be mentioned—

General plethora;
Exposure to cold and moisture;
Sudden mental disturbance;
Sluggishness of portal circulation;
Displacement of the uterus;
Fibrous tumors;
Areolar hyperplasia;
Endometritis;
Pelvic cellulitis and peritonitis.

Some of these causes, even without exciting true inflammation, may keep up a state of hyperæmia in the uterine vessels, which, being augmented at menstrual epochs, creates pressure upon the neighboring nerves, and consequently pain.

Symptoms.—A patient who has previously menstruated painlessly is seized during a period with severe pelvic pain, accompanied by diminution or cessation of the discharge and considerable constitutional disturbance. The pulse becomes full and rapid, the skin hot and dry, and the eyes suffused. There is severe pain in the head, with nervousness, restlessness, and sometimes, though rarely, a little delirium. There may be in addition rectal and vesical tenesmus and diarrhœa. In cases in which a local inflammation exists as the flow begins or before that time, the patient suffers from dull, heavy, fixed pelvic pain, which lasts until the process is ended, and often even afterward.

Differentiation.—If the attack be due to hyperæmia merely, without inflammation, the constitutional disturbance and suddenness which characterize it will mark its difference from the neuralgic and obstructive forms, as the absence of signs of inflammation in the intervals will do from the inflammatory. If it be due to the influence of existing pelvic inflammation, it will usually be marked by pain during the intermenstrual periods, difficult locomotion, fatigue after exertion, leucorrhœa, etc.

Prognosis.—This will depend upon the prognosis of the condition which has given rise to it. If that can be removed, the dysmenorrhœa, which is one of its symptoms, will disappear; if not, it will continue without material diminution. If the cause of the symptoms be a fibrous tumor, pelvic peritonitis, or peri-uterine cellulitis, or even an irremediable displacement, the probability of immediate relief is of course not at all great.

Treatment.—As in the neuralgic variety, the source of the evil should be carefully ascertained before remedial measures are adopted. If it be due to plethora, the lancet, cathartics, strict diet, exercise, and fresh air will be indicated. Decided congestion of the uterus, as shown by turgid feel and purple appearance of the cervix, would indicate local abstraction of blood by scarification or leeches. Should the attack be accidental and have occurred from exposure to cold and moisture, opiates, diaphoretics, and sedatives will give speedy relief. In case a sluggishness of the portal circulation exists, this should be stimulated to greater energy by mercurial cathartics and a change in the habits of life from sedentary to active. A retro-displaced uterus is often kept in a constant state of congestion, which can be relieved only by properly sustaining the organ. This, according to our experience, is a frequent cause for congestive dysmenorrhœa. In many of these cases it will, upon recognition of the displacement, be scarcely credited by the practitioner that it is sufficient to be productive of the result. Yet replacement of the uterus and removal of superincumbent weight by means of a skirt supporter and abdominal pad will give such complete relief as to put all doubts at rest. If a fibrous tumor be the cause, a cure will depend upon its susceptibility of removal.

Should any local inflammation be discovered as the cause of the evil, this, and not one of its many results, should be the subject of treatment.

Obstructive Dysmenorrhœa.—If, after the collection of blood in the uterus, any obstruction exist which prevents its escape into and through the vagina, a violent spasmodic pain is excited which often amounts to uterine tenesmus. To this form of painful menstruation the name of obstructive dysmenorrhœa has been applied. The obstruction may exist in the os or cervix uteri, in the vagina, or at the vulva, where that canal is partially closed by the hymen.

Pathology.—If any organ be filled with fluid beyond the point of tolerance—as, for example, the bladder, stomach, or large intestine—violent contractions of the distended fibres which make up its walls are excited, and spasmodic efforts which have received the name of tenesmus are established. If evacuation result from these, relief is obtained; if not, contractions continue for a long time. When occurring in the uterus they present the symptoms which characterize the affection which now engages us, and which are very similar to the expulsive pains occurring during normal labor.

Causes.—The special causes of such obstruction are—

Congenital or acquired contraction of the cervical canal;
Flexion or version of the uterus;
Vaginal stricture;
Small polypus *in utero*;
Obturator hymen;
A fibroid in the parenchyma of the neck.

Any one of these causes may produce the result by partially occluding the cervical canal, so as to allow of the escape of fluid imperfectly and painfully. Contraction of the cervix may be congenital, or may result from inflammation of the mucous lining of the canal, or diminution of its calibre by contraction of the parenchyma from the use of strong caustics within the os or other cause. The last cause was formerly a prolific one, the condition commonly resulting from the passage of the actual cautery, solid stick of nitrate of silver, or potassa cum calce into the canal of the cervix. Fortunately, at the present day these agents are but seldom employed, and hence this form of contraction is now rarely met with. Flexion obstructs the canal by creating an angle in its course. Versions much more rarely produce the difficulty, but sometimes, the os being by reason of the displacement pressed very firmly against one wall of the vagina, a partial obstruction is produced.

[Some time ago a young girl presented herself at my clinique at the College of Physicians and Surgeons, declaring that at every menstrual epoch she suffered from the most intense bearing-down pains, which exhausted her greatly. Upon examination I found a partial closure of the vagina, the result of sloughing during typhus fever, which had produced an accumulation of blood above it. This excited uterine contraction, and each effort caused the expulsion of a small amount of the fluid collected above the stricture.—T. G. T.] In like manner the hymen may prevent free escape and produce uterine tenesmus. Obstructive dysmenorrhœa produced by this cause does not really come under the heading intended to be covered in this section, which, in common with the other forms of painful menstruation, treats only of dysmenorrhœa produced by abnormal conditions of the uterus and appendages. For a full description of retention of menstrual blood from occlusion of the genital tract see the chapter on this subject.

Sometimes a small polypus comes down to the os internum and rests upon it, obstructing the egress of fluid, but permitting the passage of a probe into the uterine body. It acts upon the principle of the ball valve, and by so doing produces the worst features of obstructive dysmenorrhœa.

Before closing the discussion of the causes of obstructive dysmenorrhœa we should state that the occurrence of this variety of painful menstruation is denied by some authors, prominent among whom is Thomas Addis Emmet. He and those who agree with him claim that whenever menstrual blood can escape from a uterine canal, no matter how small or how tortuous or bent it is, there can be no such thing as a mechanical obstruction to the exit of the blood. Besides, in such cases a probe or sound can often be introduced to the fundus without difficulty or great pain. They therefore claim that this variety does not exist, and they point to those cases in which menstruation occurs absolutely painlessly through a flexed, contracted uterine canal and pinhole external os. Undoubtedly this is true, but such occasions are certainly the exception, and those instances in which the conditions just mentioned are attended by severe expulsive pains until the more or less coagulated blood has been expelled are the rule. Besides, a uterine canal which may be perfectly patulous in the intermenstrual period, when the mucous membrane is undeveloped, becomes decidedly the reverse just before and at the beginning of the menstrual period, when physiologically the mucous membrane of the uterine cavity develops to three or four times its normal diameter. So much is certain, that whenever coagula are expelled with contractile pains the blood must have accumulated within the cavity of the uterus for a sufficient length of time to cause it to excite efforts on the part of the organ to throw it off, and that such accumulation must be due to the absence of natural free drainage from the cavity. If this is not painful menstruation caused by an obstruction to the free discharge of the natural flow of blood, we are at a loss to know what to call it.

Symptoms.—After menstruation has continued for some hours, and sufficient blood has been collected in the uterus to distend it, a severe spasmodic pain occurs over the pelvis which has been styled "uterine colic." This rapidly passes into a violent expulsive effort like the contractions attending miscarriage, which in time causes the passage of a certain amount of blood. Then severe pain ceases for a time, until further distension and obstruction occur, when the process by which the uterus empties itself is repeated.

It will be clear to the observer that the difficulty develops itself by three steps:

1st. Some obstruction causes a collection of blood in the uterus;
2d. This excites uterine contraction by distension;
3d. Uterine contraction, to a limited degree, frees the uterus and gives ease.

This is the pathology of the condition, whether the obstruction exist in the vagina, at the vulva, or in the cervical canal. If it exist at the last point, the efforts of the uterus will generally expel a small clot, and then a gush of imprisoned blood will follow, much to the patient's relief.

Differentiation.—The symptoms just related are so marked and decided that little difficulty will generally be experienced in determining as to the pathology of the case. Before such a decision is arrived at, however, physical exploration will usually place the matter beyond a doubt. The absolute obstruction may generally be demonstrated by difficulty in the introduction of a probe into the cavity of the uterus. Should the obstruction exist in the vagina the finger will detect it, and if in the cervix the probe will do so with almost as great precision.

It cannot be denied, however, that in exceptional cases a degree of constriction at the internal os which will admit the sound may, by some spasmodic action occurring at menstruation, offer an obstruction to escape of blood. Indeed, we feel that in all the varieties of dysmenorrhœa spasm of the fibres of the os internum plays a much more important *rôle* than is generally appreciated. It is this fact which explains the occurrence of severe pain at certain periods, while at others there is little or none. In some women there appears to be a regularity about this irregularity, the pain occurring without assignable reason every second month.

Prognosis.—This will depend entirely upon our ability to overcome the mechanical obstacle. Should it not be possible to remove this, the constantly repeated distension of the uterine cavity, and consequent effort required for emptying it, will frequently result in endometritis. If uterine displacement exist, it should be treated by mechanical means; any narrowing of the vagina should be overcome, and if possible any obstructing neoplasm removed. If the indication in a given case can be completely fulfilled, the prognosis is good, but not otherwise.

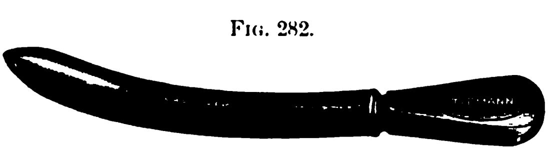
Treatment of Cervical Constriction.—Should it be discovered that the cause of difficulty consists in congenital or acquired constriction of the cervical canal, the condition may be remedied by two methods—dilatation and incision, the means for accomplishing which may be thus presented at a glance:

- Dilatation—
  - By sounds;
  - By tents;
  - By expanding instruments.
- Incision.

If the constriction be due, as it very commonly is, to flexion forward of the body or neck of the uterus, the point of stricture will usually be found near the os internum; if it be due to congenital deformity without flexion, it will usually be found at the os externum; while if an escharotic have created the difficulty, the entire length of the canal may be found deficient in calibre.

DILATATION.—*Sounds.*—The dilatation of a constricted external and internal os and cervical canal by sounds has been practised for many years. To whom the credit for its introduction is due is perhaps difficult to say. One of the earliest practitioners to employ this method was Dr. Mackintosh of Edinburgh in 1832. He used graduated metallic rods. The late Dr. Kammerer of New York was an ardent advocate of this practice. Prof. Hegar has devised a series of very finely graded hard-rubber sounds, with which he claims to be able to dilate in a very short time and at one sitting any uterus to a size sufficient to admit the index finger. The late Dr. Peaslee and Dr. H. T. Hanks of this city

FIG. 282.

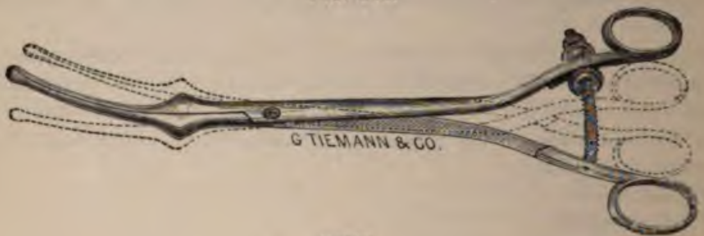


One of Hegar's set of Graduated Sounds.

have also devised sounds for this purpose. We have frequently practised and more frequently attempted this method with variable success, and have finally abandoned it, for the reason that it often fails on account of the impossibility of forcing the larger sizes of the sounds through the canal, even under anæsthesia, and because we have a far more ready, convenient, and equally safe method at hand in the instrument known as the steel two- or three-branched dilator, presently to be described. The graduated sounds are highly recommended by Hegar, Fritsch, and other German gynecologists of repute.

The expanding dilators have come into use chiefly since the introduction into this country of the dilator of Ellinger of Stuttgart, the first specimen of which was brought to this country by Mundé. A number of improvements of this instrument have since been constructed by Palmer, Goodell, and Elwood Wilson, all of which have two blades and dilate bilaterally. J. Marion Sims devised a dilator with three branches, which of course separated the uterine walls more thoroughly, but was at the same time rather more dangerous than the two-branched instruments. The dilator which we habitually employ, and which has answered every requirement that we saw fit to ask of it, is that of Palmer of Cincinnati.

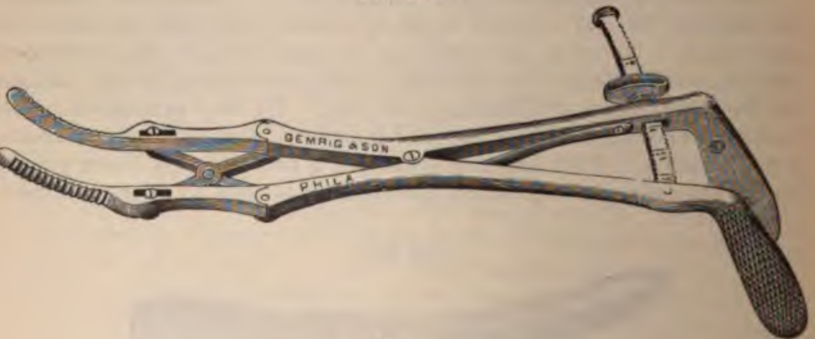
FIG. 283.



Heavy.

Palmer's Dilator.

FIG. 284.



Heavy.

Goodell's Dilator.

Both the sounds and the expanding dilators may be used at the physician's office, and we have thus employed them many hundreds of times without experiencing the slightest ill result. Still, there can be no doubt that the danger of exciting a pelvic peritonitis by this procedure is always present, and that a risk is taken in performing dilatation and sending the patient home which really should be avoided if possible. Not every patient, however, can afford to take an anæsthetic and keep in bed for a day or two simply for the purpose of having her uterus stretched, and we therefore will probably still continue to perform dilatation at the office under proper antiseptic precautions, sending the patient home as speedily as possible, and telling her to keep quiet for the rest of the day; and, if our previous good luck does not forsake us, our patients will be benefited and no evil results will ensue. If very thorough dilatation, however, is to be employed, as in bad cases of constriction, or if discission is to be practised at the same time, or a stem pessary is to be inserted, and especially if the treatment is directed not only to the cure of the dysmenorrhœa, but to the cure of the accompanying sterility, it is best to do the operation thoroughly at the house of the patient under anæsthesia and all antiseptic precautions, followed by rest in bed, with an ice-bag on the abdomen, for twenty-four to forty-eight hours. If performed in this manner, more lasting benefit will probably result than if less thoroughly but more frequently practised at the office.

While moderate dilatation will often relieve temporarily, to secure permanent results it must usually be repeated a number of times, the most thorough dilatation being practised just before an expected period.

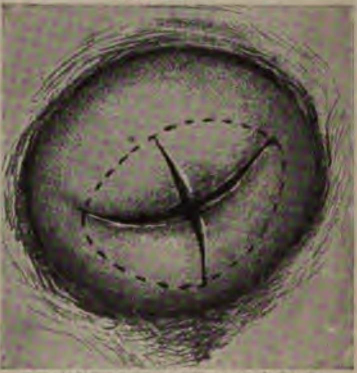
Dilatation may be practised either on the fingers or through a speculum, preferably, of course, the Sims, the branches of the dilator being separated so as to indicate on the cross-bar over the handles an internal dilatation of one-half an inch. Allowing for a small amount of feathering of the blades, this degree of dilatation is not excessive or dangerous.

Tents.—The sponge tent is no longer used by careful or progressive gynecologists; the laminaria or the tupelo tents, however, are fairly safe if aseptically employed, and if left *in sitû* eighteen to twenty-four hours produce a more lasting expansion than the rapid forcible dilators. As they should always be inserted at the house of the patient, who is kept in bed until and for some time after their removal, their use is attended with considerable inconvenience, and therefore restricted to the more serious cases requiring dilatation.

INCISION.—Prof. Simpson of Edinburgh was probably the first to advocate, in 1843, the practice of cutting through the walls of the cervix for the cure of dysmenorrhœa. He employed a closed knife, which was introduced through the internal os and then opened by a spring and withdrawn, the blade cutting to a desired depth through one side of the uterine wall. It was then reintroduced and the operation repeated on the opposite side. Hemorrhage was stopped by brushing the surface with a solution of persulphate of iron. Greenhalgh, Stohlmann, White, and others have invented complicated metrotomes or double-bladed hidden knives for the purpose of cutting through the constricted part at one blow, but these instruments have the disadvantage of sometimes cutting deeper than is intended, and thus wounding either the peritoneum or a large vessel. They have, therefore, become more or less obsolete, most operators of the present day preferring to trust to their own sense of touch as to how deep the incision is made, rather than to hidden springs and complicated mechanisms. The simplest method of performing the operation of bilateral division—or discission, as it is called—of the uterine canal is that devised by Sims, several modifications of which have been introduced by various operators whose names have become attached to their modifications.

Operation.—The method which we employ preferably is the following: With the patient in the Sims position, through a Sims speculum the cervix is exposed, a tenaculum hooked into the anterior lip of the external os, and if this orifice is abnormally small it is then incised in the following manner: A blunt-pointed bistoury or a pair of straight sharp scissors is used, and the cervix divided to the limit of a quarter of an inch in four directions—anteriorly, posteriorly, right, and left. Each of these little flaps thus formed is hooked up with a tenaculum and trimmed off with a pair of fine curved scissors. This makes a funnel-shaped external orifice. A sound or probe is then passed through the internal os, its diameter and the direction of the uterine canal carefully ascertained, and if possible a straight blunt-pointed bistoury is passed through the internal os and the constricted portion divided quadrilaterally to the depth of a sixteenth of an inch; that is, until the circular fibres are felt to yield under the knife. The probe-pointed knife shown in Fig. 204, devised by the late Dr. Studley of this city, is inserted and gently pushed forward until the blade passes through the internal os. It is then turned and the other three incisions made in the usual manner. It is now our practice, unless some contraindication (history of pelvic inflammation) is present, to introduce the Palmer dilator and thoroughly dilate the uterine canal. Having then washed out the vagina with a 1 : 5000 bichloride solution, with which also the uterine cavity is mopped out on an applicator, a thick glass or hard-rubber plug is passed up into the uterus and kept in place by tampons of iodoform gauze. If this is done, neither sepsis nor hemorrhage need be feared. Inflammation can be controlled by rest in bed and the ice-bag to the hypogastrium. After three or four days, or when the gauze has become saturated with the sero-sanguinolent oozing which invariably follows this operation, it is removed and replaced, the stem being left undisturbed. If we do not fear hemorrhage, in place of the iodoform gauze a Thomas cup pessary is inserted to keep the stem in place; indeed, we use this more frequently than we do the gauze. The vagina is kept clean by daily irrigations with 2 per cent. carbolized water. After a week, if the patient experiences no pain and there are no bad symptoms of any kind, she may be allowed to leave her bed, wearing the stem constantly until the beginning of the next menstrual period, when the stem may either be removed, to be reintroduced at the cessation of the period, or it may be left undisturbed. Some operators have had stems made with grooves along the sides or with perforations through the centre to permit the free escape of the menstrual blood. We have never seen the blood obstructed by the presence of the stem, but will admit that this may occur and that the blood may become septic, and have therefore thought it best to remove the stem during the menstrual period. The individual preferences of different operators must be the guide as to which course to pursue. For the cure of obstructive dysmenorrhœa it is usually not necessary that a stem should be worn longer than during two or three intermenstrual periods following the first operation. For the cure of sterility, however, especially when the obstruction was due to an aggravated degree of anteflexion, the stem may have to be worn for a year or longer in order to ensure permanent straightening and patulousness of the uterine canal. Where only the external os is constricted the crucial incision (Fig. 285) alone need be practised, the canal being kept open by frequent dilatations—that is, at least once a week—with the Palmer dilator.

FIG. 285.



Crucial Incision of External Os for Dysmenorrhœa or Sterility.

Treatment of Cases dependent upon Flexion or Version.—Should version be the cause of dysmenorrhœa, it should be relieved, not by operation, but by the means already mentioned when speaking of that displacement. If the difficulty be due to flexion, and more particularly to anteflexion, two indications offer themselves for its relief: First, to straighten the bent canal by keeping the body of the uterus erect; second, to effect the same end by surgical operation.

If a uterus be flexed below the vaginal junction, it is evident that obstruction to the menstrual flow will occur at the point of flexure, and equally evident that an incision through both sides of the canal would not overcome this by straightening it, while a single incision through the posterior wall would do so. In 1862, Dr. Sims conceived and practised such an operation successfully. The doubtful value of this procedure from a practical standpoint, in spite of its theoretical and anatomical correctness, has already been pointed out in the chapter on Anteflexion.

Treatment of Vaginal Stricture.—This condition, which may be congenital or be induced by syphilitic or cancerous disease or by sloughing, if so complete as entirely to obstruct the canal produces amenorrhœa. If it be a pervious stricture it may result in dysmenorrhœa.

The affection may be treated by three methods: dilatation by large bougies, dilatation by tents, and incision. If syphilis be ascertained to be the basis of the local disorder, constitutional means should at the same time be resorted to.

Treatment of Dysmenorrhœa from Polypus.—Should the presence of a small polypus be discovered, the cervix should be dilated by tents and the growth removed.

Treatment of Obturator Hymen and Fibroids.—The first should be incised, and the second removed, if possible, by one of the methods mentioned under the head of Fibroids.

MEMBRANOUS DYSMENORRHŒA.—*Definition.*—This variety of dysmenorrhœa consists in the expulsion of organized material from the uterine cavity at menstrual periods, which is found upon microscopical examination to consist of the lining membrane of the uterus itself. This may consist of a sac, representing the triangular cavity of the body of the uterus with its three openings, or it may come away piecemeal as shreds or strips of mucous membrane.

Observers since the time of Morgagni have recognized this form of disordered menstruation, but looked upon the mould cast off as formed of false membrane, and as being a result of croupy or diphtheritic endometritis. For the true explanation of the phenomenon we are indebted to Simpson, Oldham, and Virchow.

Pathology.—Dr. Oldham's opinion, which strikes us as the most rational, not only upon theoretical grounds, but from close observation of those cases which have come under our notice, is that at some time during the intermenstrual period the entire lining membrane of the uterus is lifted from its base and separated, so as to be ready for extrusion at one of the next menstrual crises. Virchow declares that a deciduous membrane similar to that of pregnancy forms, and for this membrane he proposes the name of the "menstrual decidua." Dr. Oldham believed that congestion of the ovaries gave rise to this remarkable phenomenon by transmitting an irritant influence to the uterus. However inaugurated, this process appears to prepare the membrane gradually for complete detachment and extrusion at a menstrual period, when it is expelled. Simpson, denying the causative influence of inflammation in the production of the menstrual decidua, regards it as a product natural to the uterus as to function, but unnatural as to time, circumstances, and frequency of development.

An entire membranous cast when washed and examined by the naked eye is found to be triangular, with three openings, two at its upper angles and one at its lower. Its external face is soft and irregular, and everywhere shows small perforations, which are openings of utricular follicles. The inner face is free from inequalities and feels like mucous membrane. These sacs are usually extruded as they lie *in utero*, but sometimes they are inverted. In one instance we have known such a sac to become inverted and expelled into the vagina, but, the cervical extremity holding its attachment at the os internum, the inverted bag hung like a polypus in the vagina. A similar case is recorded by Mme. Boivin.

Under the microscope the cast is found to consist of the lining membrane of the uterus, hypertrophied in all its elements almost exactly as it is in pregnancy. The vessels of the mucous membrane are increased in size, capacity, and number, a small-cell proliferation of interglandular tissue has taken place, and great development has occurred in the utricular glands, the mouths of which are visible even to the naked eye. The absence of the chorion villi and of the large, irregular decidua-cells of pregnancy easily distinguishes the membrane from the decidua of pregnancy.

Etiology.—This part of our subject constitutes one of its most important and interesting points, but, unfortunately, that diversity of opinion which always characterizes unsettled questions is found to exist here. Our want of accurate information depends upon the fact that the true pathology of the condition is not known. Some, with Oldham and Tilt, regard it as a result of ovarian disease; others, with Raciborski, Lebert, Handfield Jones, and Simpson, look upon it as a pure desquamation or exfoliation of the uterine mucous membrane, for which no cause can be assigned; while Klob and others are convinced that it is an exudation the result of endometritis, thus returning to the position assumed by our forefathers. In further reference to etiology we shall give a *résumé* of the views which have been and are received, and mention some of the authorities who adhere to them:

1. It was formerly believed that a layer of plastic lymph was, as a result of endometritis, thrown out over the uterine wall, which, becoming organized, constituted the cast of the uterus. This belief was entertained by Montgomery, Dewees, Siebold, Frank, Naegele, Désormeaux, and others.
2. It is now regarded as an exfoliation of the entire mucous membrane of the uterine body, due to congestion and irritation transmitted to the uterus. This view, conceived by Oldham, is adhered to by Semelaigne and others.
3. The pathological explanation just mentioned being adopted, the cause of the occurrence of the exfoliation is attributed, in the words of Scanzoni,[1] to "a considerable hyperæmia of the walls of the uterus, which is followed by an excess in the development of the mucous membrane." This theory is adopted by Courty, Hegar, Eigenbrodt, and others. The last two authorities have proposed for it the name of "dysmenorrhœa apoplectica."
4. Prof. Simpson[2] attributed the exfoliation "to an exaggeration of a normal condition or to an exalted degree of a physiological action." Mandl[3] declares that Rokitansky, Robin, Mayer, and others adopt this view.
5. It is regarded as due to an inflammatory condition by Klob,[4] who declares that "those pathologists were not far from the truth who described such cases as endometritis." This view is endorsed by Tilt,[5] Braun,[6] and others.
6. By some the membrane is regarded as due to a deciduous formation excited by conception, which has just been established, or is ovular in its character. The first of these views is maintained by Hausman[7] and admitted in some cases by Rokitansky;[8] and the second was advanced by Raciborski.

From our observation of this affection we cannot attribute it to endometritis alone, for evidence of the existence of that disease was entirely wanting in four cases out of five. Even if endometritis exist with marked displacement, it must not be concluded that these conditions have necessarily produced exfoliation, for they are commonly present as results in cases in which dysmenorrhœa of membranous type has lasted long without evidence of their existence.

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[1] *Op. cit.*, p. 348.

[2] *Clin. Lect. on Dis. of Women*, Am. ed., p. 109.

[3] Dr. Mandl of Vienna, translated in the *Amer. Journ. of Obstet.*, vol. ii. p. 402.

[4] *Op. cit.*, p. 237.

[5] *Lancet*, 1853.

[6] Expression of opinion in Dr. Mandl's case. See his article, p. 413.

[7] Mandl's article, p. 407.

[8] Klob, *op. cit.*, p. 237.

Recent observations have not added anything particularly new to the account of this disease given in our last edition. We have, therefore, not thought it necessary to alter our description in any important detail, except with regard to the possibility of mistaking this condition for an abortion, which we at present know to be unlikely if the microscope is allowed to settle the question.

Frequency.—We cannot regard the disease as one of frequent occurrence, for in our experience we have met with it scarcely a dozen times. It is true that we have seen a number of cases which had been regarded as of this character, but most of them proved not to be so upon closer examination. Scanzoni reports twenty-one cases.

Differentiation.—The diseases with which this may be confounded are—

Early abortions;
Blood-casts, or fibrinous moulds of the uterus;
Exfoliation of the vaginal mucous membrane;
Diphtheritic endometritis.

From the first of these the differentiation can be accomplished by the progress of the case, the repetition of the process, and the entire absence of the symptoms of pregnancy. We have already stated that the absence of the characteristic villi of the chorion and of the large irregular decidua-cells of pregnancy definitely settles the question against that condition. This knowledge is an outcome of the improved microscopic observations of recent years. Before the publication of the last edition of this work this question was still in doubt, since two such authorities with the microscope as Rokitansky[1] and Wedl[2] of Vienna, quoted by Mandl (*op. cit.*), differed diametrically in their opinion of the nature of a specimen from the same patient, Wedl pronouncing it to be a portion of the decidua and chorion of an ovum in the first weeks of pregnancy, and Rokitansky claiming that the specimen merely showed a development of the mucous membrane in excess of its usual menstrual degree, and not connected with conception. Since membranous dysmenorrhœa may occur in the virgin, it is of some importance to be able to make this differential diagnosis with absolute certainty, and fortunately at the present day this seems to be possible.

Blood-casts will readily be recognized by the microscope. No elements of uterine mucous membrane are discovered.

The microscope too will readily show the nature of false membranous casts of the uterine body, and of exfoliations of the vagina due to what Dr. Tyler Smith has styled epithelial vaginitis or to contact with perchloride or persulphate of iron.

Symptoms.—With the commencement of the menstrual flow there are steady pains, which increase as this progresses until they become violent and expulsive like those of abortion. Under these the os gradually dilates and the membrane is forced out into the vagina. Then there is commonly a tendency to menorrhagia, which, however, soon disappears, and the patient has passed through the attack. For some time after it has passed off there are symptoms of endometritis and purulent and sanguineo-purulent discharges. Sometimes, according to Huchard and Labadie-Lagrave, who have written an excellent article upon this subject in the *Archives générales* for July, 1870, membranous dysmenorrhœa becomes complicated by diphtheritic endometritis, which is engrafted upon an attack of endometritis set up by the affection which we are considering.

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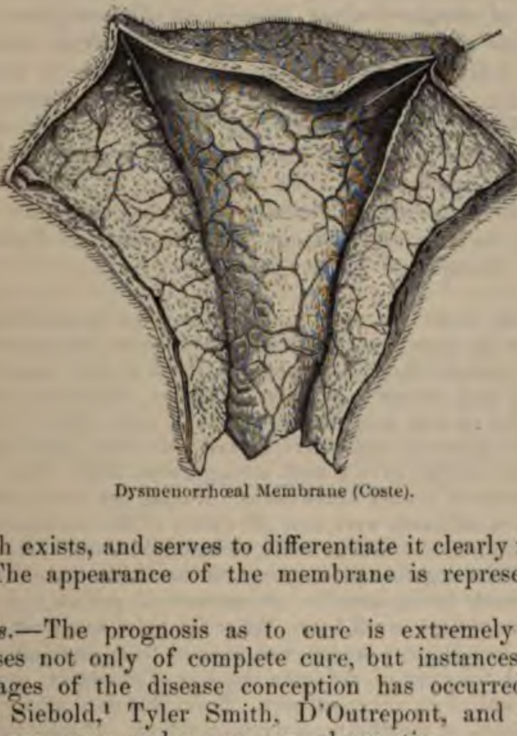
[1] Mandl, *op. cit.*, p. 415.

[2] *Ibid.*, p. 416.

Pain occurring with the commencement of menstruation ends only with the discharge of the exfoliated membrane. This membrane, as has been already mentioned, is pathognomonic of the kind of dysmenorrhœa which exists, and serves to differentiate it clearly from all other varieties. The appearance of the membrane is represented in Fig. 286.

FIG. 286.



Dysmenorrhœal Membrane (Coste).

Prognosis.—The prognosis as to cure is extremely unfavorable, although cases not only of complete cure, but instances in which in advanced stages of the disease conception has occurred, have been reported by Siebold,[1] Tyler Smith, D'Outrepont, and others. Two such cases have come under our own observation.

Treatment.—When the etiology and pathogenesis of a disease are unknown, it is astonishing to see how various, contradictory, and energetic treatment usually is. Deficiency of knowledge in these respects rarely results in an expectant plan of treatment. It commonly induces excessive vigor of interference. In the disease which we are now considering the actual cautery has been freely applied to the cervix, while solid nitrate of silver and other caustics have been carried up to the fundus.

Uncertain as we are as to the pathology of the disorder, little can be said with any positiveness as to treatment. For relief of the violent pains which attend the attack nothing compares in quickness, certainty, and efficiency with the injection of morphia by the hypodermic syringe. If this use of the drug be not inadmissible on account of constitutional intolerance, it should be resorted to once in every eight or every twelve hours. Should there be any objection to its use, the pains of the attack should be quieted by inhalations of sulphuric ether, carried only to the point of producing quiescence of the nervous system, not sleep or unconsciousness.

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[1] Mandl, *op. cit.*, p. 423.

If uterine or ovarian disease be detected, it should be treated in accordance with general rules. If no such cause for the exfoliation be discovered, applications of alterative character may be made to the uterine mucous membrane, as tincture of iodine, chromic or carbolic acid, solution of nitrate of silver, or solution of persulphate of iron. Dr. Fordyce Barker reports very satisfactory results from passing into the cavity of the body an ointment containing from one to three grains of iodoform to the amount introduced. Should displacement exist, it should be relieved, upon the principle that if we cannot cure a disorder, it is at least wise to relieve its most prominent complications and disagreeable symptoms. The meagreness of this advice as to the treatment of so distressing a malady is but too apparent, but there is no help for it, as it arises from an absolute want of knowledge as to more certain therapeutic resources.

[In one case under my care I effected a cure by the following means: First, dilatation by sponge tents, which were inserted once a week during an intermenstrual period (the sponge tent was used in this case on account of its stimulating and alterative quality: I believe this to be the last case in which I used the sponge tent—namely, fifteen years ago); second, through removal of the diseased endometrium with the sharp curette, followed by swabbing of the uterine cavity with strong nitric acid. The latter was repeated at intervals of a week three times. During the two menstrual periods intervening no membranes were cast off, owing to the destruction of the uterine mucous lining by the sponge tents, curette, and nitric acid. Intra-uterine galvanism with the negative pole, sponge on the abdomen, was then practised three times a week during another intermenstrual period, the current being as strong as the patient could bear. After the third menstrual period, which was free from membrane, a wedge was excised from each lateral surface of the cervix, with the view of reducing the size of the large, engorged uterus, and the edges united by silver sutures. From that date on the patient never had another attack of membranous dysmenorrhœa. It may be objected that the cure was worse than the disease; but as all authorities admit that this disease is usually incurable, and as the patient expressed herself perfectly satisfied with the result, I do not think that any fault can be found with the length or severity of the treatment.—P. F. M.]

OVARIAN DYSMENORRHŒA.—*Definition.*—In a number of cases, unfortunately by no means small, no depreciated condition of the nervous system will be found to account for habitual dysmenorrhœa, and the most careful exploration of the pelvis will fail to discover uterine or peri-uterine disorder. In such cases, if by conjoined manipulation the regions to the side of and behind the uterus be investigated, a globular, slightly-compressed mass, about the size of a large walnut or small egg, will often be found in the cul-de-sac of Douglas or on one or both sides of the uterus, low down and in close proximity to it. If the patient be now placed in the left lateral position, and two fingers of the right hand be carried up the vagina, their palmar surfaces looking backward, the presence of these smooth and movable bodies will be still better ascertained. They are the ovaries, enlarged, congested, tender, and prolapsed.

In some cases their disordered condition will be accompanied merely by dysmenorrhœa, but in others it will be marked by hysteria, amenorrhœa alternating with menorrhagia, and even by true epilepsy. Whether epilepsy is in such cases due to the existing ovarian disease we are unprepared to state; but we have occasionally seen it accompany it, and must confess our belief that it may sometimes be caused by it. This is the condition commonly styled chronic oöphoritis, which consists in congestion as its first stage, and hyperplasia of tissue with excessive nervous hyperæsthesia as its second.

The cystic enlargement of a number of Graafian follicles, so-called *hydrops folliculorum*, does not produce either local pain or reflex manifestations. Such ovaries may feel precisely like those enlarged by subacute or chronic congestion, but they are much less tender, and do not become reduced in size after the subsidence of the congestion, as is the case with the latter, nor do they yield to local treatment.

Symptoms.—It would be difficult to make the diagnosis of this form of painful menstruation by rational signs alone. It should rest upon a union of rational and physical signs, but a suspicion as to the nature of the case would generally be formed from the former. The pain precedes the bloody flow by several days, and diminishes as it is established. It is of a dull character, extends down the thighs, is peculiarly likely to be accompanied by nervous manifestations and to create depression of spirits. The breasts often sympathize, becoming painful and tender to the touch.

One very curious phenomenon which now and then marks these cases is the occurrence of intermenstrual or "intermediate pain," as it has been styled by Dr. Priestly. At times this occurs with wonderful regularity on a given day. In one case in our experience it occurred on the ninth day after menstruation had ceased; in another on the fourteenth; and in a third it commenced one week after the menstrual act, and continued for five or six days.

It must not be supposed that in every case in which the ovaries are discovered to be large, tender, and prolapsed dysmenorrhœa will necessarily exist, or that they will always be found in this condition where there are other reasons for suspecting ovarian dysmenorrhœa. The rule is as we have stated, but it is by no means without exceptions.

Pathology.—It is possible that the process of ovulation in a diseased ovary may excite, through its extensive and decided nervous connections, congestion and nervous hyperæsthesia in the uterus, which would create disordered menstruation of the congestive or neuralgic type. Ordinarily, however, the pain seems to be in the diseased ovaries themselves, and to depend upon the dehiscence of the follicles of De Graaf. This can be proven by touching these organs during the early periods of menstruation, and is made evident in cases in which ovulation occurs without menstruation, in cases of atresia or absence of the uterus.

Prognosis.—The prognosis of dysmenorrhœa due to this cause is very bad. In a young girl in whom ovarian disorder has advanced only to congestion recovery may rapidly take place; but in a woman farther advanced in life, and in whom chronic enlargement of the ovaries has occurred and become associated with great tenderness and prolapse, the prospects of cure are very unpromising.

Treatment.—In such cases sterility is, we think, the rule. If utero-gestation should be inaugurated, the nine months of inactivity and repose secured by it to the ovaries is likely to be of great service. We have yet to meet with a case of chronic character in which we have effected a cure by purely medicinal means. By anodynes and nervines of course pain may be annihilated, but this is far from effecting a cure, and their use possesses the additional disadvantage of exposing the patient to the dangers of contracting a bad habit in reference to their future employment.

All means calculated to soothe local irritation, to give tone to the nervous system, and to combat sanguineous excitement should be resorted to. Change of air and scene, a visit to the mineral springs and baths of Germany and France, and removal of all influences which severely or disagreeably tax either mind or body will often accomplish great good. Warm sitz-baths and warm and soothing vaginal injections should be employed, and complete rest in bed, or great quietude if the patient objects to bed, should be prescribed during menstrual periods and for three or four days after them. Internally, we know of no means which are so efficacious as the free use of the bromides of potassium and ammonium, commenced a week before the menstrual act and continued until its close.

During menstruation, opiates, alcoholic stimulants, and anæsthetics should, as far as possible, be avoided. Their use will probably give relief, and as a consequence they will be resorted to once a month thereafter. The danger of such a course is apparent. In place of them the tincture of cannabis indica, hyoscyamus, and camphor, or five-grain doses of the monobromate of camphor, may be employed. In some cases we have known a rectal suppository of five grains of iodoform to give great relief.

We are unwilling to convey the idea that even these means are prolific of good results in such cases. They are by no means so, and are merely offered as the best with which we are acquainted. Our own experience leads us to dread the application for relief of one of these obstinate and unsatisfactory cases.

Before leaving this subject we must put the reader upon his guard in reference to the following point. In treating of the subject of dysmenorrhœa we have accepted all the varieties which are generally indicated by authorities, because we believe that by their adoption a more thorough investigation of the subject is secured, and because experience leads us to think that a recollection of them at the bedside will aid the practitioner in classification and treatment. It must not, however, be supposed that every case of dysmenorrhœa will prove susceptible of strict limitation to one of these varieties. Such an anticipation will lead to disappointment and distrust of this classification. Many—indeed most—cases demonstrate the existence of more than one disturbing element. Thus, for example, retroversion occurring in a debilitated, weak, and nervous woman, whose blood is impoverished, might cause a dysmenorrhœa, due in part to mechanical obstruction, in part to neuralgia, in part to congestion, and perhaps even, to a certain extent, to a secondary endometritis. Too much must not be expected from any classification, and it must be borne in mind that one of the great ends in view in adopting this style of arrangement is the attainment of thoroughness of investigation and facility of remembrance.

In view of the fact which we have just mentioned, it is well for the practitioner to have at his disposal some general plan of treatment which may be resorted to in cases not readily susceptible of classification. The following is one which we think will be found effectual: As soon as menstruation begins, or some hours before if its approach can be recognized, the patient should go to bed and apply warmth, by bottles of hot water, hot bricks wrapped in dry flannel, or, as is better, by bags of India-rubber filled with hot water, to the feet, abdomen, and sacrum alternately. She should then take by the rectum an enema composed as follows:

℞. Tr. asafœtidæ,	ʒij;
Tr. belladonnæ,	gtt. xx;
Tr. opii,	gtt. x;
Aquæ tepidæ,	℥iiiss.—M.

S. Throw the whole into the rectum and retain.

If the patient have any decided objection to the use of an enema, the following prescription will be found very useful:

℞. Chloral. hydrat.,	ʒij;
Potassii bromidi,	ʒij;
Morphiæ sulphat.,	gr. iss;
Syrupi aurantii cort.,	℥iij.—M.

S. A dessertspoonful in a wineglassful of sweetened water every four hours while in pain.

The following suppository will sometimes prove useful in place of the enema:

℞. Belladonnæ ext.,	gr. j;
Extr. opii aquos.,	gr. iij;
Asafœtidæ gum.,	ʒss;
Butyr. cacao,	q. s.

M. et ft. supposit. No. vj.

S. One by the bowel night and morning while suffering.

We must again reiterate that one great care of the physician in these cases should be to avoid creating in the patient a craving for opiates and stimulants, which should never be administered except by direct prescription of the physician, renewed at each menstrual period in accordance with the amount of pain.

CHAPTER XLI.

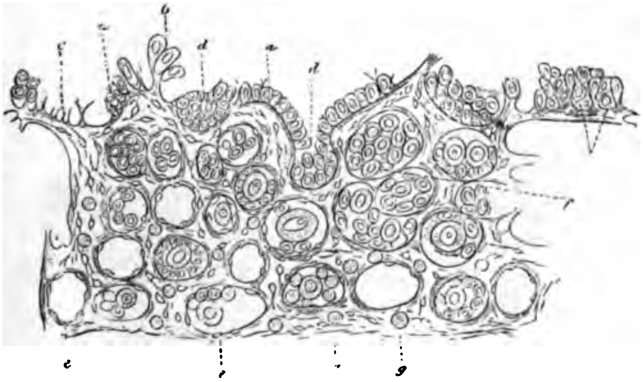
DISEASES OF THE OVARIES.

History.—Ancient literature is singularly barren upon the subject of ovarian diseases. That the functions of these organs were known to early anatomists there is no doubt, for as early as 200 B. C. the operation of castration of female animals is alluded to by Aristotle, and in the second century A. C. they were described by Galen under the name of "testes muliebres." As to the influence exerted by them upon menstruation they were not informed, for they attributed that process, according to Aristotle, to a superfluity in the blood—an opinion which was entertained even by Hippocrates. The works of Aëtius make no mention whatever of ovarian disorders, and those of Paul of Ægina are equally silent. When it is borne in mind that the ovular theory of menstruation dates back for its origin to the labors of Négrier, Gendrin, Bischoff, Pouchet, and others of our own time, and that the operation of ovariotomy was never systematically performed before the year 1809, it will be appreciated how recently the profession even in modern times has fully grappled with the subject.

During the past thirty years full amends have been made for this delay in progress, for in that time no portion of the field of gynecology has received more attention or been more thoroughly investigated than that which now engages us. Not only have most of the diseased conditions of the ovaries been satisfactorily investigated, and the diagnosis of them reduced to a scientific system, but for the most frequent and important of them surgical means have been instituted with such success as to have given procedures of the most appalling character and undoubted dangers the position of legitimate and justifiable operations. The recent literature of ovarian pathology and surgery is now enriched by the contributions of so many capable observers that it is almost invidious to particularize the most prominent.

These remarks apply not only to large tumors of the ovary, with which their removal by abdominal section has made us thoroughly familiar at the present day, but also, if to a somewhat lesser degree, to the minor diseases of that organ—namely, those of an inflammatory character. Our present improved means of diagnosis, chiefly by bimanual palpation, have taught us not only to detect in a large majority of cases the normal ovaries, but also the comparatively trifling enlargement produced by acute and subacute inflammations and chronic congestions of that organ. Of course an experienced touch is requisite for the recognition of the difference between a normal ovary and one slightly enlarged by the above-named conditions or by the presence of a number of slightly distended Graafian follicles. We can remember very well how, twenty years ago, it was considered quite a feat of diagnosis to detect the normal ovary by bimanual palpation. [Prof. Leopold of Dresden and myself, who in 1871 were fellow-students in the General Hospital at Vienna, made a special point of seeing in how many cases we could make this diagnosis, and were both surprised and pleased to find that it was by no means as difficult as was generally supposed.—P. F. M.] At that time our knowledge of the minor diseases of the ovary was gathered mostly from the post-mortem examinations, where that organ was found more or less enlarged by inflammation or slight cystic development or adherent from often unsuspected local peritonitis—conditions which had not been detected, or even thought of, during life. All this has now changed, for we can at present, in nearly every case where bimanual palpation is at all possible, arrive at a very fair idea of the size and probable pathological state of an ovary which has undergone one of these minor forms of disease. In this recognition we have been very much aided by the information obtained during laparotomies for the removal of ovaries and tubes thus affected. Of course the histological degeneration of the ovary must remain a mystery, or at best a matter of conjecture, until the organ has been removed and subjected to the crucial test of the microscope. Our knowledge of the minute diseases of the ovary and of the Fallopian tubes, as will be proved hereafter, is one of the greatest achievements made in the department of gynecology in recent years. Realizing the present state of our information on this subject, it is curious to note that Hennig not more than twenty-five years ago made the statement, judging from 100 post-mortem examinations made by him, that in 10 out of 100 cases the diseased state of the ovary was or might have been recognized during life more frequently by rectal

FIG. 287.



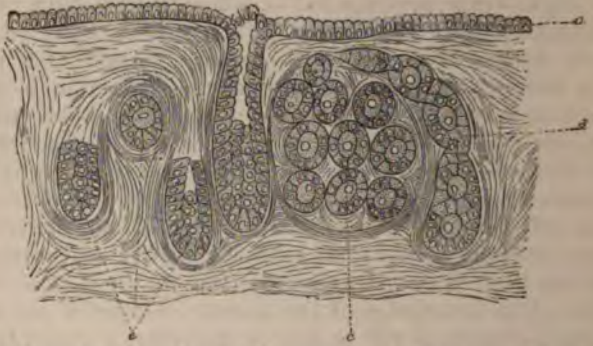
Gradual Formation of Graafian Follicles, first stage (Waldeyer and Leopold).

a, a, epithelium; b, b, earliest recognizable ova-cells already in the epithelial stratum; c, connective-tissue columns advancing into the epithelial stratum; d, d, collections of cells in process of imbedding (invagination?); e, e, primary follicles surrounded by small connective-tissue cells; f, groups of epithelial cells (ova) already imbedded (invaginated), among which are individual larger cells (primordial ova); g, corn-cells of His.

exploration than by vaginal or abdominal. To-day we should expect to make the diagnosis during life, so far as macroscopical changes go, in 90 out of 100 cases.

Anatomy of the Ovaries.—The ovaries are two follicular glands about the shape and size of small almonds, situated one on each side of the uterus. So dependent are they upon the position of the uterus and surrounding viscera that they have really no fixed place. They are usually found in the lateral and posterior parts of the true pelvis, about an inch from the uterus, and just below the point where the Fallopian tubes enter that organ, the left being in close proximity with the rectum. Each ovary is attached to the peritoneum, which connects it with adjacent structures, and is firmly united with the uterus by means of a fibrous cord arising from the horn of each side.

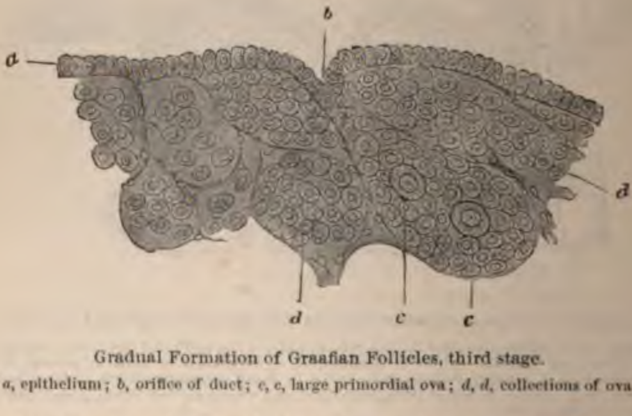
FIG. 288.



Gradual Formation of Graafian Follicles, second stage (Waldeyer and Leopold).

a, epithelium; *b*, ovarian duct with free extremity; *c*, larger group of follicles with racemose arrangement; *d*, ovarian duct containing ova; *e*, *e*, oblique and transverse section of ovarian ducts.

FIG. 289.

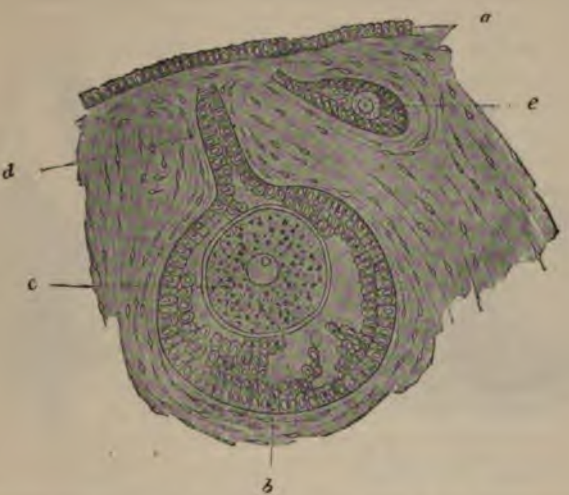


Gradual Formation of Graafian Follicles, third stage.

a, epithelium; *b*, orifice of duct; *c*, *c*, large primordial ova; *d*, *d*, collections of ova.

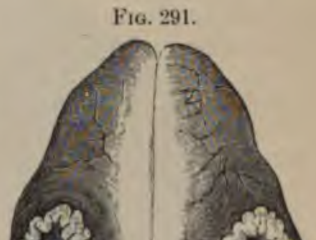
The Fallopian tube of each side is connected with the ovary by one

FIG. 290.



Gradual Formation of Graafian Follicles, fourth stage. (Fully-formed ovum in the follicle.) *a*, epithelium; *b*, large Graafian follicle, with duct-like process, *d*, and ovum, *c*; *e*, small duct-like follicle.

FIG. 291.

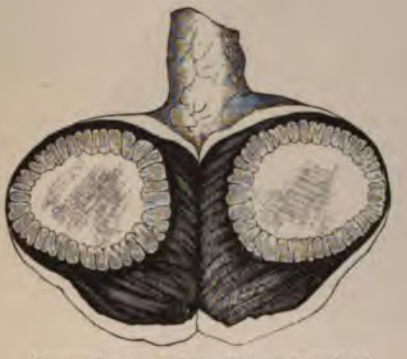


Section of Ovary, showing corpus luteum three weeks after menstruation (after Dalton).

fimbria, and acts at periods of ovulation as its excretory duct. The surface of the ovary is not covered by peritoneum, for, arrived at the circumference of these organs, this membrane loses its characteristic appearances, and the only trace of it which is discoverable is a layer of basement epithelium. Around the circumference of the ovaries a cortical portion exists whose duty it is to generate the Graafian follicles. Within this is a fibrous structure, composed of muscular fibres, cellular tissue, vessels, and nerves, which receives the name of stroma. Removed from the stroma and examined with care by the microscope, each of the Graafian vesicles is found to consist of a sac, called the tunic, which is filled with fluid, the liquor folliculi, in which is contained the ovum or egg which is the female contribution to conception.

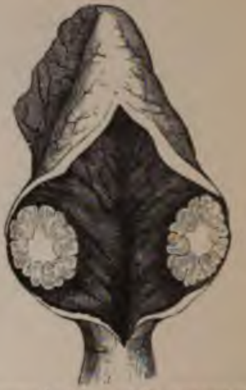
It is now accepted as a fact by most physiologists, although still contested by some, that the periodical discharge of blood from the uterus which is called menstruation is merely a uterine symptom of the discharge of one of the ova from the ovary by rupture of a follicle. After the period of puberty has arrived one or more of the follicles of each ovary burst every month by the following process: a congestion or hyperæmia, occurring in the ovary for some reason beyond our comprehension, causes an excessive secretion by the walls of the follicle, in which a miniature dropsy takes place. This goes on to rupture, and escape of the liquor folliculi, blood, granular cells lining the ovisac, and the ovum. The nerve-supply to both uterus and ovaries is excited by this process, and one of the results of such excitement is contraction of the delicate middle layer of uterine

FIG. 292.



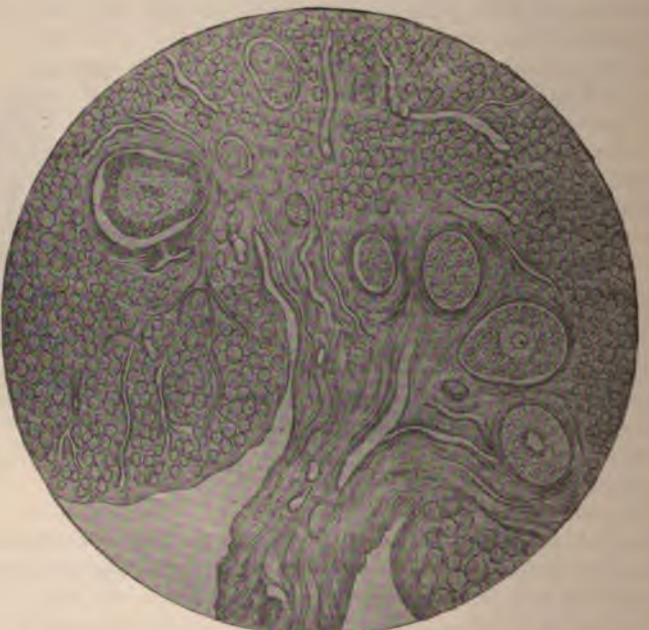
Corpus Luteum of the Fourth Month of Pregnancy (after Dalton).

FIG. 293.



Corpus Luteum of Pregnancy at Term (after Dalton).

FIG. 294.



Hylus Ovarii of Newborn Child (Beigel).

fibres which surround the network of minute vessels enveloping and penetrating the uterine structure. This throws the vascular apparatus into a state of erection. Great engorgement occurs on the surface of the uterine mucous membrane, and probably on that lining the Fallopian tubes; they rupture and a flow of blood takes place. Three elements are concerned in this discharge: 1st, ovarian irritation excited by ovulation and transmitted to the nerves governing the muscles constituting the middle coat of uterine fibres; 2d, erection of the uterine vascular system; 3d, consequent rupture of the blood-vessels of the mucous membrane of the uterus and escape of blood. The ovisac being thus emptied, a clot of blood soon forms within it, then an hypertrophy of the cells lining it occurs, and the corpus luteum is formed.

If the examiner hold up one of the broad ligaments between himself and the light, a small plexus of white crooked tubes will be seen forming a cone, the apex of which is directed toward the hilus of the ovary. It measures about an inch in breadth, and consists of about twenty tubes which are filled with a clear fluid. This is the organ of Rosenmüller, which has recently been minutely described by Kobelt under the name of the parovarium, and is supposed by him to be an exaggeration of the Wolffian body. The exact location of the parovaria is this: they lie beneath the ovaries and between the ultimate folds of the peritoneum covering the fimbriated extremities of the Fallopian tubes, which have received the name of the alæ vespertilionum.

The ovaries are supplied with blood through the spermatic (or, rather, ovarian) arteries, which, upon arriving at the margin of the pelvis, pass inward between the layers of the broad ligaments, and thus reach their lower border. Their nervous supply is not extensive, and is derived from the renal plexus.

The ovary presents its most perfect type in the young virgin, when its dimensions are greatest and its surface is undeformed by the numerous cicatrices which appear at a later period. The dimensions of this organ are greater than they are during early virgin life only during and for six weeks after the process of utero-gestation. Hennig, who has made a special and exceedingly minute study of this point, declares that pregnancy increases the length, but not the breadth nor the thickness, of the organ. Utero-gestation, which leaves the uterus larger than it was before, has the contrary effect upon the ovaries, which after its accomplishment diminish in size, never again to attain their former dimensions while in a state of health.

Varieties of Ovarian Disease.—Any one or all of the tissues which have been mentioned may be affected by disease, or the position of the ovary may be altered to such an extent as to constitute a morbid state. The following table presents a list of the disorders of these glands which will now receive special attention:

Absence;
Imperfect development;
Atrophy;
Inflammation;
Neoplasms.

Absence.

One or both of the ovaries may be congenitally absent, but such a condition is very rare. When it does exist, it is generally only a part of a complete want of genital development, which is manifested not only by these organs, but by the parts making up the vulva, the vagina, and the uterus. When one ovary is absent, it is usually a case of absence of the same horn of the uterus, or uterus unicornis. Kiwisch declares that it has been most frequently observed in the bodies of newly-born infants who were not viable on account of complicated deformities. Where there is congenital absence of the ovaries the woman is generally small in stature, her figure undeveloped, as if the period of girlhood were abnormally prolonged, and the genital system imperfect, as already mentioned. In some cases the mind is very deficient, a condition bordering upon idiocy sometimes existing. In others this is not the case, but the patient suffers from depression of spirits and appears to lack vigor both of mind and body. Development into womanhood has never arrived for her, and she remains a child without the vivacity and cheerfulness of childhood.

[This statement, however, does not always hold good. During the past year I have seen two cases—one of a girl of eighteen, the other of twenty years—in whom the general physical development found in a female of those ages was present without the slightest exception, barring the absence in the first case of the ovaries, so far as a careful vaginal and rectal bimanual examination could determine, and the presence of a rudimentary uterus; and in the second case the entire absence of both ovaries and uterus, only a few crescentic fibrous strands representing the latter organ. But both girls were well-developed and perfect specimens of feminine physical beauty at that time of life. The external genital organs and vagina were natural in formation and size, and only the mammary glands were conspicuous by their absence. In neither of these cases had there ever been the least sign of a menstrual epoch. Treatment of course was out of the question.—P. F. M.]

Although certainty can only be arrived at post-mortem, a diagnosis may be made during life by a thorough examination with one or two fingers through the rectum, aided by the other hand on the abdominal wall. Indeed, one of the greatest benefits which can accrue from a correct conclusion will consist in the avoidance of all efforts which, being vainly addressed to exciting the performance of the functions of the ovaries, deteriorate the state of the patient. Should the general condition of the patient, the undeveloped state of the vulva, vagina, and uterus, and the entire absence of the menstrual crisis combine as evidences of the condition, a diagnosis is admissible.

Imperfect and Irregular Development.

This condition, which consists in persistence of the fœtal state of these organs after the period of puberty, when rapid development should have occurred, is by no means so rare as that just mentioned. It may exist on one side only, though it generally affects both. As in the case of absence of the ovaries, a certain conclusion is not easy, and as in that case also we drew a presumptive conclusion from want of development in the other organs of generation, absence of the usual signs of the menstrual crisis, and lack of general constitutional vigor and development.

[As examples of cases susceptible of such an explanation, I record the histories of two with which I have recently met. The first is that of Miss F——, referred to me by Dr. Rodenstein of New York. She is twenty-four years of age, and yet has the appearance of a girl of thirteen. Indeed, it is difficult to believe the statement that she is more than that age. The features, limbs, mode of expression, and general deportment are those of a child. She has never menstruated nor shown any evidences of a tendency to do so. Physical exploration shows the vulva in the state of early girlhood, the mons veneris destitute of hair, the labia thin, and the vagina so small and narrow that the little finger only can be introduced, and that causes great suffering. The canal being short as well as narrow, the uterus can be touched, and is found like a little nut in the vagina, so light that its weight is scarcely perceptible.

The second case is one which I saw with Prof. W. H. Thompson. The patient is eighteen years old, and has never menstruated. Previous to the treatment established by Dr. Thompson she suffered greatly from epileptic seizures, which have evidently impaired the force of her intellect, but during the two months before I saw her she had been free from them. The girl is slow in her movements, childish in manner, and stupid in replying to questions. Upon physical exploration the vulva, vagina, and uterus are found fully and perfectly developed, the latter giving by measurement with the uterine probe two and a half inches. Nothing can be elicited with reference to the ovaries by physical means, but the rational signs mentioned, together with the fact that all the appearances of girlhood are combined with entire absence of any apparent effort at ovulation, render the supposition that the ovaries are undeveloped or fœtal highly probable.—T. G. T.]

[Exceptions to these two cases occasionally occur. During the past winter I chanced to meet with an instance of complete amenorrhœa in a married woman twenty-four years of age. She had never had any signs of impending menstruation, but stated that she had frequent irregular attacks of epistaxis. She consulted me on account of the amenorrhœa and sterility. She was a perfectly formed, well-developed, handsome woman, and an examination revealed a vagina of normal length, but an infantile uterus and ovaries. There was no indication for active interference, since her general health was perfect. I advised the frequent local use of the faradic current as a stimulant to the uterus and ovaries, but promised no positive results.—P. F. M.]

Sometimes cases will be met with in which masculine development, emansio mensium, and sterility will lead to a diagnosis of absence of the ovaries, but which will subsequently undergo a change and give all the evidences of the presence and efficiency of these organs. [One such case, which occurred in the practice of Dr. Metcalf and myself, is worthy of record. Mrs. B——, a large, muscular, and handsome woman, had menstruated very irregularly and scantily for ten or fifteen years. Sometimes the menstrual discharge would be entirely absent for months; then it would at long and irregular intervals show itself for a day. Her health was not affected by this in any way. She presented, however, many signs of masculinity: the voice was harsh, the breasts flat, and the chin covered with a sparse beard. After having been married for years she became pregnant, and in due time bore a child, subsequent to which she menstruated more regularly and plentifully, and has since borne two children.—T. G. T.]

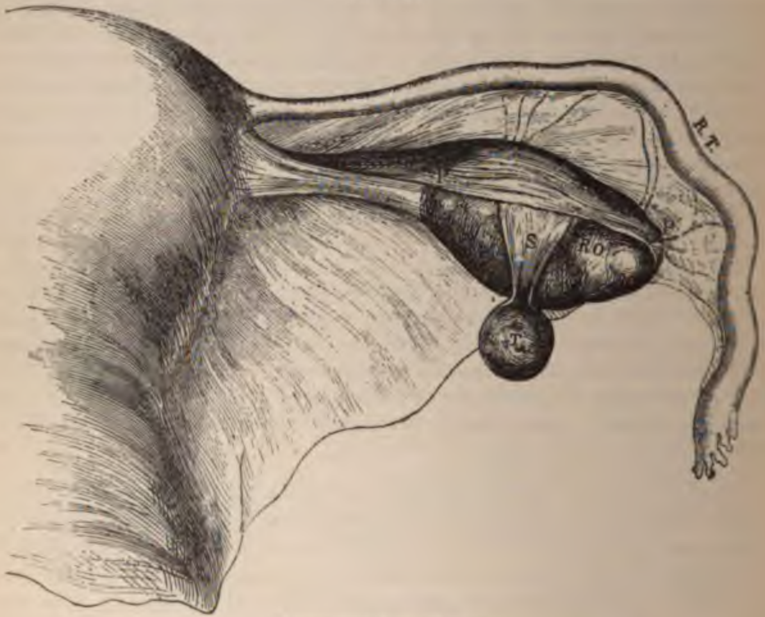
Treatment.—Should the ovaries be congenitally absent, it is evident that art can do nothing to remedy the evil. Should they exist in an undeveloped or fœtal state, it is possible that by a proper stimulus applied to them by the most direct means in our power growth and maturity may be fostered, unless the condition be one of aggravated arrest of development. The means which are most likely to accomplish this are—

General tonics;
Uterine irritation;
Electricity;
Marriage.

The sanguineous and nervous systems should both be brought into as perfect a state of health as possible by ferruginous and bitter tonics, fresh air, exercise, change of scene, and a general observance of the laws of hygiene.

The most direct method for irritating the ovaries is through the uterus, with which so close a sympathy exists. For this purpose tents may be occasionally resorted to—as often, for instance, as once or twice a month. This not only prepares the uterus for its part of the process

FIG. 295.



Accessory Ovary (Beigel).

R. O., right ovary; R. T., right tube; S, accessory ligament; T, accessory ovary.

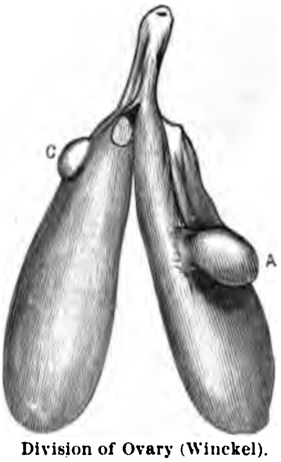
of menstruation, but causes a hyperæmia in the ovaries, which we know to be the physiological forerunner of ovulation.

Electricity (usually the faradic current) may be employed by placing one pole of a battery over the spine and one over the ovaries, or, more effectually, by carrying one pole, protected where it touches the vagina, to the cervix uteri, connecting this with a battery, and passing the other pole over the ovaries. An intra-uterine galvanic pessary may likewise answer a good purpose when worn steadily and persistently.

The ovarian irritation and congestion incident to the marital act will sometimes excite ovulation—not at the moment of coition, as was formerly supposed, but remotely.

IRREGULAR DEVELOPMENT.—A few instances are on record in which the ovary is either developed in a peculiar manner, so as to be divided into two more or less separate parts, or else a constriction of the organ has taken place by means of constricting cicatricial bands. Beigel was the first to call attention to a pathological condition of the ovary which he termed "accessory ovary." In 350 autopsies on female cadavers he found 8 times at the boundary-line of the peritoneum and the ovary one or more small excrescences varying from the size of a millet-seed to a cherry, which on dissection were found to consist of true ovarian structure. Winckel reports having found this anomaly 18 times in 500 dissections of the female genitals. Further, the ovary may be divided into two similar portions, practically appearing like two ovaries. (See Fig. 296.) The ovary may also be constricted, either congenitally or by cicatricial bands, so as to have a deep dent about its middle. Winckel describes a case of partial constriction of the left ovary with cystic disease of the constricted portion. (See Figs. 297 and 298.) All the cases of this anomaly which have been reported up to the present time have been collected by Winckel,[1] as follows: 1. Grohe, three ovaries, two on left side; 2. Klebs, two right ovaries; 3. Sinéty, one ovary with seven pedunculated appendages; 4. Olshausen, constriction of left ovary from peritonitis; 5. Winckel, two ovariotomies on same patient, two cysts at first operation, and another removed at the second, the latter tumor having been developed from the constricted portion of the right ovary; 6. Winkler, double cyst on one side, due to constricted double ovary; 7. Hoëgh, similar to No. 6; 8. Kocks, three ovaries removed by operation, the third in the left broad ligament: operation, hysterectomy for carcinoma of the cervix; 9. Mangiagalli, supernumerary ovary lay between right ovary and the uterus; 10. Winckel, right and left ovary in normal position, supernumerary ovary situated in front of the uterus closely attached to the posterior

FIG. 296.



Division of Ovary (Winckel).
A C, accessory ovaries.

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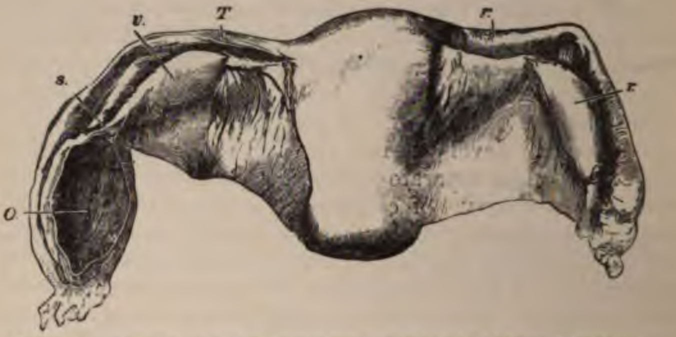
[1] *Textbook, loc. cit.*

wall of the bladder. To this should be added 11. Mundé, three ovariotomies on same patient, two right and left by Prof. Kuester of Berlin, verified by letter from that gentleman; the third by Mundé for an intra-ligamentous dermoid cyst of the left side, which must have originated either from a portion of the left ovary left behind or from a third ovary on that side. In addition, Mundé has removed during the past winter, from an unmarried woman upon whom he operated for a dermoid cyst of the right ovary, the left ovary constricted and enlarged in the manner shown in the accompanying cut.

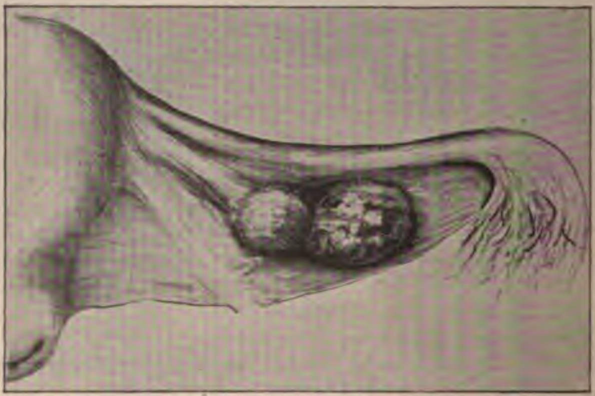
Fig. 297.



Cystic Degeneration of a Constricted Portion of the Left Ovary (Winckel).
T, left tube; *r*, *s*, *O*, left ovary; *r*, *r*, right tube and ovary.

It is evident that these abnormal developments of the ovary may render it possible for an operator to apparently remove both ovaries, either for tumors or for minor disease of the organ, and to leave behind by accident a third accessory ovary, which may keep up the functions of ovulation and menstruation, and, if by some chance the Fallopian tube of the respective side should be left permeable, also permit the patient to conceive.

Fig. 298.

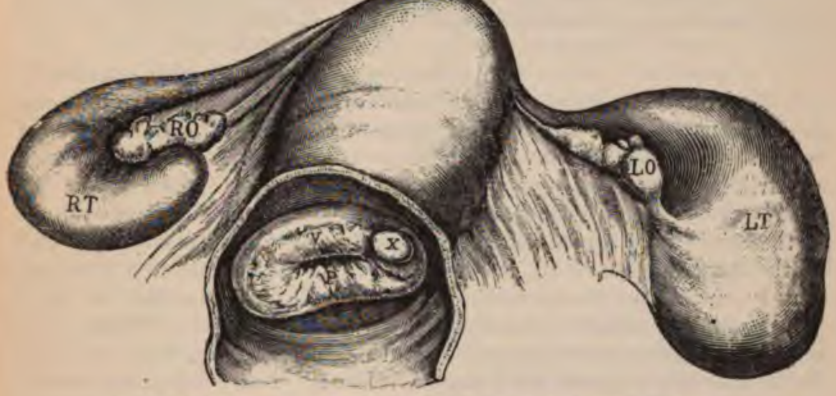


Left Ovary Constricted (Mundé).

Atrophy of the Ovaries.

At a period varying from the forty-fifth to the fiftieth year the ovaries are destined to undergo atrophy. They diminish in volume, become wrinkled, the Graafian follicles disappear, and the stroma becomes dense and non-vascular. This is a physiological process, and marks what is termed the menopause or period of menstrual cessation. Sometimes this process sets in at a very early period, owing to some abnormal condition which has excited it, and produces the same results as those following it when it takes place at the normal time.

Fig. 299.



Senile Atrophy of Ovaries and Uterus—Double Hydro-salpinx (Beigel).
RT, right tube; RO, right ovary; LT, left tube; LO, left ovary; VP, vaginal portion of cervix; X, mucous polypus.

Causes.—With regard to the special causes of this occurrence very little is absolutely known, further than the fact that it sometimes occurs from pelvic inflammations. It is probable that acute oöphoritis may produce it, and it is certain that at times it results from pelvic peritonitis.

[The following case, which presented itself at my clinique some time ago, is illustrative of this fact: Mary G——, a healthy young Irishwoman, aged twenty-four years, stated that she had a miscarriage at the third menstrual period, five years before, in Albany. Three days after the product of conception had been cast off she was taken with a chill, with violent pain over the abdomen, and was declared by her physician to have inflammation of the bowels. Of this attack she nearly died, but after a confinement to bed for six weeks grew better. For two years after this she had irregular, painful, and profuse menstruation. As she expressed it, whenever she became fatigued or excited flooding would come on. After this time the menstrual periods disappeared, and she now applied for relief on account of amenorrhœa of three years' standing. Physical exploration revealed the uterus in normal position, though diminished in size to about two inches. Nothing could be ascertained about the ovaries.

The view which I took of the case was that pelvic peritonitis and acute oöphoritis originally existed; these left the parts in such a state that for two years metrorrhagia and menorrhagia occurred; then, subsequent contraction occurring in the effused lymph in and around the ovaries, atrophy resulted with its usual consequence, amenorrhœa.—T. G. T.]

Other diseases besides pelvic peritonitis may produce atrophy of the ovary; thus, typhoid fever, scarlatina, variola, are occasionally followed by a shrinking and a cessation of the physiological function of the organ.

[I have had under my care a case of a single lady, forty-one years of age, who having regularly menstruated up to her nineteenth year, was seized with an attack of typhoid fever, after which she never experienced the slightest sign of menstrual molimen or flow. The physical examination revealed atrophied ovaries and a small senile uterus. She consulted me for a sciatic neuralgia which she supposed might depend upon some diseased pelvic condition. Treatment proved ineffectual.—P. F. M.]

The peculiarly destructive influence exerted upon the ovaries by pelvic peritonitis will be impressed upon any one who makes an autopsy in a patient who has died of that affection, or who reads the reports of others. Very often the ovaries cannot be discovered in the mass of "putrilage" which occupies their site.

Treatment.—An attempt may be made, by the means recommended in the treatment of undeveloped ovaries, to excite ovulation in any part of the glands which may still be capable of performing the function. But it should not be persisted in if not at once attended by good results, for inflammatory action may be excited by it. When these means are essayed great caution should be observed and their influence developed only to a limited degree. Benefit from treatment can be expected only when menstrual molimina recur with more or less regularity. In their absence it is absolutely useless to endeavor to excite the ovaries to increased growth or renewed function.

Apoplexy or Hematoma of the Ovary.

Definition.—Apoplexy of the ovary consists in a rapid effusion into its tissue of blood, which results from rupture of one or more of its larger vessels.

The ovaries present the only example in the animal economy of apoplexy occurring as a physiological act. At each menstrual period, as an ovule leaves its nidus, an apoplexy from the vessels of the tunic of the ovisac occurs as a necessary consequence. It is this which, upon subsequent alteration, constitutes the corpus luteum. Generally these hemorrhages are self-limiting and their effects rapidly disappear; in some cases, however, the bleeding continues too long or returns after cessation, and then the collection of blood sometimes reaches the size of a man's fist or of a child's head.[1] In some instances the tunica albuginea of the ovary is completely ruptured, when the effused blood pours into the most dependent portion of the pelvic cavity, constituting pelvic hematocele.

Sometimes after one severe hemorrhage, but usually in consequence of the recurrence at more or less distant intervals of a number of effusions of blood, the stroma of the ovary becomes entirely destroyed, and is replaced by one sac containing the effused blood. These recurrent hemorrhages excite an inflammatory reaction in the neighborhood of the ovaries, and adhesion of the organ to the adjacent surface of Douglas's pouch takes place. These adhesions are a fortunate provision of nature, since they tend to prevent the rupture of the hemorrhagic sac into the peritoneal cavity. Each recurrent menstrual period produces an increase of blood in the sac, and perhaps also a new inflammatory reaction in its surroundings. While the primary effusion of blood, often only of small amount and confined to one or two Graafian follicles, is called apoplexy of the ovary, the destruction of the whole organ by recurrent extravasations of blood into its substance is known as hematoma of the ovary. The blood is usually thin, dark, and mixed with small black coagula. This condition may go on for a variable length of time, rupture seldom taking place.

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[1] Kiwisch, *op. cit.*, p. 232.

Symptoms.—The occurrence of apoplexy is often ascertained only in autopsy, no signs existing during life by which it can be positively diagnosticated. The symptoms which will usually point to its existence are sudden and violent pain over the region of one ovary, with sense of great exhaustion, nausea, and vomiting. These symptoms, if combined with enlargement and tenderness of one ovary, as ascertained by conjoined manipulation, will be sufficient to render a diagnosis warrantable if the patient's health has previously been good.

Diagnosis.—If the hemorrhagic sac is so distended by its contents as to be tense, the diagnosis of a small ovarian cyst bound down by adhesions may be made by conjoined manipulation; the nature of its contents can, however, be ascertained only by means of vaginal aspiration. Should they prove to be dark bloody fluid, the diagnosis of an ovarian hematoma is usually correct. It might be the Fallopian tube containing blood, it is true, but the oblong shape of the tube as compared with the more spherical circumference of the ovary will usually enable us to differentiate between the two.

[In three cases, one a lady from Montana, another from Vermont, and the third from New York, I was absolutely unable to detect by repeated careful bimanual examination any enlargement or disease of either ovary or tube. The patients' constant complaints of pain and persistent demand for an operation and relief from the pain finally induced me to comply with their requests. On opening the abdominal cavity I found in all three cases that the ovaries were enlarged to about the size of an orange, with flaccid walls and universally adherent. On peeling the sacs out with the fingers, they burst, and the thin dark grumous blood which they contained escaped, at once clearing up the diagnosis. Both sacs were removed, the pedicles ligated, the abdominal cavity washed out with tepid sterilized water, and closed without drainage. All three patients made good recoveries. The difficulty in detecting the ovarian sacs was readily explained by the fact that their walls were lax and flaccid, and could no more be felt by the palpating fingers than can the coils of the small intestine.—P. F. M.]

Prognosis.—The effusion of a small amount of blood into a Graafian follicle, also productive of considerable pain at the time, is a matter of no serious consequence, since a blood-clot forms and may be absorbed or become organized; but if the ovary is more or less destroyed by the effusion of a larger quantity of blood into its stroma, the pain experienced by the patient is not only severe and more or less constant, but, as already stated, localized peritonitis is liable to occur and to return; and later on possible rupture of the distended ovary, either into the peritoneal cavity, or, if it happens to develop in that direction, between the layers of the broad ligaments, may take place. In the former case an acute peritonitis may be excited which may terminate in death, or a pelvic hematocele may be formed, the effused blood being shut off from the peritoneal cavity by intestinal adhesions. If the hematoma ruptures between the layers of the broad ligament a pelvic hematoma is formed, which, if the amount is sufficient, may bulge down into the vagina and produce pain and serious discomfort by its pressure on the neighboring organs. It is fair to say that rupture of this kind, either upward or downward, occurs with comparative rarity, such effusion being usually due to rupture of the distended Fallopian tube—a subject to be discussed hereafter. If rupture does not take place and the diagnosis of incurable ovarian disease is made, the removal of the offending organs ensures the only means of a restoration of the patient to perfect health.

Treatment.—The symptoms of ovarian apoplexy or hematoma are so vague that no definite treatment can be recommended to arrest the effusion of blood in the early stages. Of course, rest in bed, ice-bag to the abdomen, administration of morphine to allay pain, are the means to be adopted on general principles, and are applicable to any case of severe pelvic pain or any other condition simulating an attack of pelvic peritonitis. Should peritonitis actually occur, the treatment adapted to this condition should be employed, which will, in the first stages, be substantially that just mentioned. The removal of the diseased organs by laparotomy is the only means of curing this condition in its advanced stages.

Displacement of the Ovaries.

The extreme mobility of these glands and the laxity of their supports have already been remarked upon. Any influence which increases their weight, draws upon them directly, or acts upon them by traction through a neighboring organ may cause them to leave their position, and even in rare cases to pass out of the pelvis in the form of hernia. For example, they may be displaced by inflammation, hypertrophy, cystic degeneration, etc., which cause increase of weight; or they may be acted upon by contractions of effused lymph, resulting from pelvic peritonitis; contraction of the ovarian ligaments, etc., drawing them out of place; or they may be affected by displacement of the uterus, pregnancy, or hernia of any of the abdominal viscera acting upon them by means of traction. A hernia of the ovary alone is very rare; it is almost always attended by hernia of the Fallopian tube or some portion of the intestines or omentum.

The most common cause of backward displacement of the ovaries is retroversion or retroflexion of the uterus. Next are enlargement of the ovaries in consequence of congestion, inflammatory hypertrophy, and diffuse cystic degeneration. The ovaries are usually displaced into Douglas's pouch, the left one being commonly felt most readily, because naturally, as first pointed out by Barnes, the left pocket of Douglas's pouch is deeper than the right. Besides, for some reason or other not yet fully explained, the left ovary is more frequently congested, inflamed, and prolapsed than the right. Thus, Mundé found that of 77 cases where either one or both ovaries were dislocated, the right was displaced 19 times, the left 46 times, both together 12 times. In 60 of these 77 cases the prolapsed ovary was enlarged; in 44 cases the uterus was also displaced: retroverted 22, retroflexed 11, anteflexed 5, anteverted 1, descensus 5. In all but 2 cases the ovaries were prolapsed posteriorly, in 2 anteriorly, both the left ovary and both enlarged.[1] Displacement of the ovaries is said to be occasionally congenital.

The ovaries may be prolapsed also into the inguinal canals, being usually then accompanied by the Fallopian tubes and in a few rare instances by the uterus itself. This condition, if confined to the ovary alone, is called hernia of the ovary, and manifests itself chiefly by the regular monthly recurrence of intumescence of the hernia. This, indeed, is the chief point of diagnosis. The ovary has also been known to be prolapsed through the femoral, umbilical, and ischiatic openings, or to form a part of a ventral hernia; and Kiwisch has reported a case in which one ovary entered the foramen ovale.

Symptoms.—The symptoms of prolapse of the ovaries vary according to the position of the prolapsed organ, the cause which has induced the displacement, and the possibility of its return to its normal position. Ovaries prolapsed behind the uterus into Douglas's pouch manifest themselves by more or less severe or constant pain in the lower part of the back, usually referred to the sacral or rectal region and intensified by the passage of hardened feces. There is further a sensation of dragging and bearing down, which is much more severe than is complained of when simple backward displacement of the uterus exists. Besides, dyspareunia or painful coition is complained of, and reflex gastric and other nervous disturbances form a part of the symptoms. If the prolapsed ovary is adherent to the bottom of Douglas's pouch, these symptoms are usually aggravated. A persistent symptom is a pain felt in the ischio-rectal fossa and hip of the affected side, often extending down the leg of the same side.

Diagnosis.—The diagnosis is easily made by vaginal examination, the prolapsed ovary being readily reached by one finger in the vagina. The experienced touch can mistake it for nothing else, since scybala in the rectum are not tender, very freely movable, and usually more than two in number. Besides, the peculiar sensation of faintness and nausea produced by pressure on the normal ovary will aid the examiner in his diagnosis.

Treatment.—The treatment consists in replacing the ovary, if it is movable, by digital manipulation or posture—that is, with the patient in the knee-chest position—and preventing it from re-entering the pelvic cavity by a suitable pessary (one with a large post-cervical bulb is to be preferred) or by astringent tampons packed behind the cervix. If a retro-displacement of the uterus exists, the reposition of that organ, together with the ovaries, and its retention by a suitable pessary, will usually suffice to keep the ovaries in their normal position. If the ovaries are adherent, however, very little can be done except to reduce congestion and relieve pain by iodine and glycerin applications to the posterior vaginal vault. Their detachment and reposition is usually impossible except by means of a laparotomy, which would be indicated only under circumstances, such as pain and recurrent attacks of peritonitis, the particulars of which will be described hereafter. In hernia of the ovary, if reposition fails, nothing but extirpation of the prolapsed organ will effect a cure.

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[1] Mundé, "Prolapse of the Ovary," *American Gynecological Transactions*, 1879.

Oöphoritis.

Definition.—By this term is meant an inflammation of the tissues of the ovary—namely, those composing the stroma of the organ, the fibrous and cellular tissue, blood-vessels, and nerves. Inflammation of the Graafian follicles is seldom met with. Formerly some doubt existed as to the exact character of this disease, but microscopical investigations have in recent years settled the question, and left no doubt that such a disease as inflammation of the ovary actually exists.

Varieties.—Oöphoritis may be either puerperal or non-puerperal. The first does not concern our present investigation, and we put it out of consideration. The non-puerperal form of the disease has been divided into acute and chronic, which will now engage us in order.

ACUTE OÖPHORITIS.—Acute inflammation of the ovary was formerly supposed to be a very rare affection except as the immediate result of parturition. The older authors state that they do not remember ever having seen an uncomplicated case (Boivin, West, Fordyce Barker). At the present day, however, we are assured that this affection does occur much more frequently in the non-puerperal state than was formerly supposed, and we now know that one of the chief factors in the production of this acute inflammation of the ovary is acute inflammation of the Fallopian tube, which spreads directly by contact or indirectly through the peritoneal membrane enveloping both organs from the tube to the ovary. Puerperal oöphoritis, it is true, is usually very much more acute and violent in its symptoms, and more frequently leads to suppuration of the organ, than the non-puerperal variety. Formerly it was believed that pelvic peritonitis produced inflammation of the ovaries and tubes; nowadays, however, the evidence seems to be in favor of the exact opposite—namely, that disease of the tubes induces inflammation of the ovaries and the neighboring peritoneum. Therefore, the statistics of Aran, quoted in our last edition, which showed that in the majority of the autopsies of "peri-uterine cellulitis" the ovaries had undergone suppurative destruction, were wrong, in so far as they seemed to indicate that peritonitis usually produces disease and destruction of the ovaries. Undoubtedly, acute inflammation of the Fallopian tube was the primary cause of the subsequent disease of the ovary and peritoneum. The late Dr. Matthews Duncan was perhaps the most prominent writer to place the relation between the disease of the ovaries and pelvic peritoneum in its proper light. He did so more or less from a clinical and post-mortem standpoint, since he performed no abdominal sections. To Lawson Tait is chiefly due the credit for having proved the correctness of Duncan's views on the basis of operations performed for the removal of the diseased uterine appendages.

The course of an acute oöphoritis is very frequently the following: first, acute endometritis; next, salpingitis; third, oöphoritis; and finally, a local peritonitis. Acute inflammations of all these parts gradually subside; their results remain, and in course of time in place of an acute inflammation a so-called chronic inflammatory condition of the organs is substituted. This "chronic inflammation" is not really an inflammation, but either a congestion, a hyperplasia, or an adhesion between the different organs. Relapses of the acute inflammation are common, and finally suppuration either of the ovary or tube may occur. Usually preceding the actual appearance of acute inflammation a congestion of the ovary and tube occurs, which may persist for a greater or lesser time, and finally subside to a return to perfect health or increase to an acute inflammatory state. The division of acute oöphoritis into peritoneal, parenchymatous, and follicular will scarcely hold good either from a clinical or histological standpoint, and has therefore been abandoned. Theoretically, such a distinction would be exceedingly convenient.

Pathology.—The stages of acute puerperal inflammation of the ovary may still be described, according to Mme. Boivin, as follows: first stage, congestion, with increase of weight and rotundity; second stage, the organ double, triple, or quadruple its normal size, tissue soft and infiltrated with yellow and violet-colored serum, with slight effusion of blood; third stage, suppuration, pus infiltrated or collected in spots; fourth stage, gray softening, disorganization, the gland becoming diffluent. The symptoms and pathological changes of non-puerperal oöphoritis are much less marked and rapid than those just mentioned, suppuration usually being the result of repeated inflammatory exacerbations.

Causes.—The causes of the disease may thus be enumerated:

Acute endometritis;
Acute salpingitis;
Pelvic peritonitis;
Gonorrhœa;
Disturbance of menstruation.

Any of the causes which have been spoken of as sufficient to cause the first three diseases mentioned may through them produce ovaritis. A form of oöpohritis called blennorrhagic is admitted by most authors as corresponding with blennorrhagic orchitis in the male. That gonorrhœal inflammations of the tubes may readily cause inflammation of the adjacent surface of the ovary and pelvic peritoneum will be easily understood when we consider that a drop of infectious or purulent secretion from the tube may reach the ovary and peritoneum at any moment.

Exposure to cold, chiefly at the approach of or during menstruation, especially if a catarrhal inflammation of the endometrium and tube or a congestion of the ovary already exists, will, in our opinion, very frequently produce an acute oöphoritis.

Symptoms.—The symptoms of this affection are so intimately associated with those of peritonitis and cellulitis that it is impossible to separate them. There is severe pain in one or other iliac fossa, with increase of heat, fever, and perhaps chill. Pressure shows the most exquisite sensitiveness, and when the part is examined by conjoined manipulation this is excessive. By that means the ovary is felt enlarged and generally depressed in the pelvis. The tube is usually associated with the ovary in the inflammatory process. These symptoms may subside upon the occurrence of resolution in four or five days, or pus forming within the gland may be discharged into the cavity of the peritoneum, the rectum, the vagina, or the bladder.

Differentiation.—This is generally impossible. The association of the disease with those which have been mentioned as being at times its causes, at others its consequences, is usually too intimate for its distinction from them. Should conjoined manipulation discover the ovary as a round ball, very sensitive, and unassociated with fixation of the uterus, a diagnosis would be admissible. Such uncomplicated cases of acute oöphoritis are seldom met with, acute salpingitis or peritonitis usually existing at the same time, as already stated. Still, we have met with a few instances of the kind, the reduction of the ovary to its normal size by time and proper treatment confirming the correctness of the diagnosis.

Prognosis.—The prognosis is favorable, though never free from an element of doubt. This applies entirely to uncomplicated inflammation of the organ, chiefly when it is non-puerperal. So far as danger to life is concerned, inflammation of the ovary seldom proves serious, with the sole exception of the formation of an abscess. As regards restoration to a normal condition of the ovary, however, in the cases where repeated occurrence of the inflammation has taken place, the prognosis is almost invariably bad. An ovary which has undergone several repeated attacks of inflammation will probably never be restored by any means whatever to its normal histological condition or proper physiological functions.

Treatment.—In accordance with the rise of temperature, an ice-bag should be placed over the affected part and antipyrine or phenacetin given to abate the fever. If the temperature does not reach 102° F. (which is perhaps an arbitrary limit), one of the best means to reduce the inflammation is to apply a blister of generous dimensions (say three by three inches) on the abdomen over the respective ovarian regions. Hot poultices should usually follow the blister until the acute inflammation has subsided. Leeches may be applied in place of the blister over the ovarian region or around the anus, but in the latter situation they are liable to be followed by more severe bleeding than is desirable, hence we seldom employ them. Perfect quiet in bed, with morphine sufficient to control pain, light diet, mild laxatives or enemata to regulate the bowels, comprise the rest of the treatment. In fact, these cases should be handled almost identically with acute pelvic peritonitis, into which the affection may at any time develop. If the occurrence of chills with variable rises of temperature and the presence of fluctuation in the inflamed ovary should occasion suspicion of suppuration in that organ, if movable and not attached by adhesions to Douglas's pouch, its immediate removal by laparotomy is indicated. Should it be adherent to the bottom of Douglas's pouch, aspiration *per vaginam*, and subsequently free incision into and drainage of the abscess, should be practised. Complete removal, however, by abdominal section would undoubtedly be the safest and most thorough means of cure under such circumstances.

Chronic Oöphoritis.—Chronic inflammation of the ovaries is an affection of common occurrence, though very little has been ascertained as to the exact frequency of the disease. So great is the sympathy existing between the uterus and these organs that uterine disorders excite ovarian pain very commonly, and give rise to many symptoms which are regarded as characteristic of this disease. Again, it is a well-ascertained fact that slight attacks of chronic pelvic peritonitis are extremely common, and unfortunately we possess no certain means for distinguishing such a disorder in the vicinity of an ovary from chronic oöphoritis.

In a certain number of cases of uterine disease the patient will complain of pain of dull, aching character over one or both ovaries, and this will very likely be augmented by menstruation. This pain, which may be more or less constant, by no means denotes necessarily an inflammation of the tubes or ovaries. It usually means nothing more than a temporary congestion of the ovaries, brought about partly by the uterine disease and partly by incidental circumstances, such as exposure to cold, unusual exercise, too frequent coition, constipation, etc. We have frequently felt the ovaries enlarged, tender, somewhat prolapsed, especially the left, with symptoms of dragging, bearing down, and local pain; which symptoms readily yielded to the use of iodine and glycerin to the vaginal vault, glycerin tampons, and hot vaginal douches, the reduction in size of the organ being easily discernible by bimanual palpation.

As regards this frequently-recurring congestion of the ovaries, as denoted by increase of size and tenderness of the organ, we have for years been inclined to compare it with the hyperæmia and swelling of the tonsil which so commonly occur on the slightest provocation in persons susceptible to diseases of that organ. As the tonsil becomes painful, engorged, swollen, and a source of irritation to its possessor, often without any known external cause, so may the ovary make its presence felt under similar conditions; and as repeated congestions of the tonsil eventually produce a hyperplasia and noticeable enlargement of that organ, so may similar occurrences of ovarian congestion ultimately result in a hyperplasia of the tissues of the stroma of the ovary. Besides, repeated inflammatory attacks of the ovary cause a thickening of the columnar epithelium covering the free surface of the organ; the Graafian follicles, distended periodically by the efforts of the ova to escape, do not rupture, and a cystic development of the follicles will ultimately or eventually take place. Thus a direct result of chronic oöphoritis is the formation of a cystic ovary, usually of the multiple variety.

As a primary affection which creates secondary uterine disorder and results in dysmenorrhœa, sterility, and hysteria, it is by no means rare. Many cases supposed to be obscure and unmanageable ones of uterine disorder, many in which the physician is sorely puzzled in accounting for the wonderful disproportion between the existing symptoms and the degree of uterine disorder discoverable, are due to this affection. Instances will not rarely be met with in which, with slight uterine displacement and a catarrh of no great moment, a patient will be entirely unable to stand or walk, except for very short periods of time, will for years prove sterile, and will suffer from agonizing dysmenorrhœa from this cause.

The prophecy made in the last edition of this work that "the coming decennium will prove that in many cases disease of these most important organs in the female economy is the source of many ills now attributed to that less important viscus, the uterus," has been abundantly verified. The records of ovariotomy, oöphorectomy, and removal of the diseased tubes during the past ten years sufficiently prove the correctness of this statement.

Symptoms.—The symptoms of chronic oöphoritis are numerous and often perplexing; no two cases of the affection presenting the same features. In some they are physical entirely, while in others the mind and nervous system are decidedly involved. In several cases in our experience true epilepsy has existed—whether as a consequence or not we cannot say, but certainly as a very suspicious complication.

The rational signs may be enumerated as—

Dysmenorrhœa;
Fixed pain over one or both ovaries;
Tendency to hysteria;
Rarely inability to stand or walk;
Sometimes pain on sexual intercourse;
Pain and exhaustion after defecation;
Pain in rectum, hips, and down thighs;
Irregular menstruation;
Sterility if both ovaries are diseased.

Dysmenorrhœa often precedes menstruation by several days. At other times it occurs just after the cessation of the menstrual discharge, while in a few cases it occurs in the interval between the menstrual periods. The last constitutes the intermediate dysmenorrhœa of Dr. Priestly, and is a most interesting symptom. At times it occurs with great regularity. In one case which occurred in our practice it showed itself invariably on the ninth day, and in another on the fourteenth. Ovarian dysmenorrhœa produces great nervous disturbance, which renders the patient peculiarly prone to seek relief in the use of opium.

We have met with several cases of this disease in which the patients have been unable to stand or walk, except for a few minutes.

If the ovary be prolapsed, sexual intercourse often proves a source of pain, but not otherwise.

The menstrual discharge is sometimes very irregular, remaining absent for months, and then showing itself as an alarming hemorrhage. In many cases it is quite regular both as to time of occurrence and amount.

The general pelvic hyperæmia accompanying chronic oöphoritis often engenders uterine catarrh.

That in many cases the patients become pregnant cannot be questioned, but, as a rule, where both ovaries are diseased sterility exists. It is highly probable that the diseased organs produce diseased or imperfect ova.

Physical Signs.—The patient being examined by touch and conjoined manipulation, the uterus will probably, in consequence of contraction of the respective ligament or dragging by the enlarged ovary, be usually found to deviate from its normal axis, laterally, anteriorly, or posteriorly, and from the cervical canal a thick mucous plug will often be found to hang. In Douglas's cul-de-sac on one or on each side of the uterus a round, soft, tender body, about as large as a walnut, will be found. This, when caught between the fingers in conjoined manipulation, will prove very sensitive to pressure, which will often produce nausea and tendency to hysteria; and even after it has been desisted from a dull aching pain will generally remain. The left ovary will usually be found more accessible than the right, the left pocket of Douglas's pouch being normally the deeper.

Prognosis.—We know of few curable disorders which we dread so much to meet as this. The day will probably come when our treatment for it will be satisfactory and efficient, but it has not yet been so by any means. Many cases will entirely baffle treatment, while all will prove little amenable to it. That they often in time recover is true, but recoveries have, in our experience, but little connection with treatment. Still, incurability of an ovary afflicted with chronic inflammation of its stroma by no means implies absolute necessity for its removal nor unqualified persistence of ill-health. It is true the ovary can never be entirely restored to its normal condition, but it may often remain entirely quiescent, and give its owner so little trouble that she is perfectly willing to bear the occasional twinges of pain, and consequent temporary confinement to bed, rather than to have the offending organ removed.

Treatment.—We have nothing better to offer than the following course: If the ovaries be found prolapsed, they should be carefully sustained by a light elastic ring pessary, and if the displaced uterus press upon them, it should be kept in position. Sexual intercourse should be limited as far as possible. If scanty menstruation exist as a symptom, one or two leeches should be applied every month to the cervix uteri. Rest should be prescribed during menstrual epochs, when the diseased glands are congested and in a state of nervous excitement. Severe exercise or fatiguing occupations should be avoided, and all influences calculated to depress the vital forces carefully guarded against. Counter-irritation by means of small blisters, applied once or twice a month over the abdomino-ovarian region, or by tincture of iodine, should be kept up for months at a time, and once or twice a week the cervix uteri and the whole upper part of the vagina should be painted over with tincture of iodine. Every night and morning the patient should be directed to use copious injections of warm water into the vagina in the manner elsewhere explained. For the various nervous symptoms which accompany the affection the bromide of potassium in ten- to fifteen-grain doses will be found very beneficial. Utero-gestation, which secures the ovaries from monthly congestions for nine months, is always much to be desired under these circumstances.

The local use of galvanism in mild currents not exceeding 20 M. A., one electrode, the positive, being placed in the vagina (metal ball covered with wet absorbent cotton), the other on the abdomen over the affected side, for fifteen to twenty minutes three or four times a week, will often give very great relief in chronic oöphoritis, allaying pain and to a certain extent reducing congestion and hyperplasia. Too much must not, however, be expected from this treatment, the good effect of which will usually be felt in half a dozen sittings if at all. The current should never be so strong as to give pain or to do more than redden the abdominal skin.

In cases where decided inflammatory enlargement of the ovaries exists, and in which the pain renders the patient's life a burden, we are justified in considering the advisability of giving her permanent relief, even at some risk, by removing the ovaries. If a woman, however, should be near the natural change of life, this operation would probably not be justifiable, since the menopause would in itself effect a cure of the case.

Before closing this chapter we would like to say that our views regarding the entire curability of this affection have not materially changed since the publication of the last edition of this book. We regret that treatment in our hands has been far too often ineffectual or but temporary in its beneficial results. Still, we wish to modify to a certain extent the statement made by us ten years ago, which implied that treatment of this disease was usually ineffectual. In cases of not too remote origin we have found local counter-irritation, hot douches, a sojourn at Kreuznach, Franzensbad, and Schwalbach, productive of great benefit, which we attribute especially to the use of the brine and moor baths systematically given at those resorts, and also to a change of climate and absence from marital relations. Indeed, we have seen in several instances pregnancy result after a return from a cure in those baths in cases where the inflammation and adhesion of the ovaries had led us at first to doubt the possibility of such an occurrence. Hence we do not wish to discourage either the practitioner, or through him the patient, from employing whatever means science affords us for the relief of this disease. Only in the very last emergency would we consent to a removal of ovaries which are diseased in no other way than as the result of chronic inflammation.

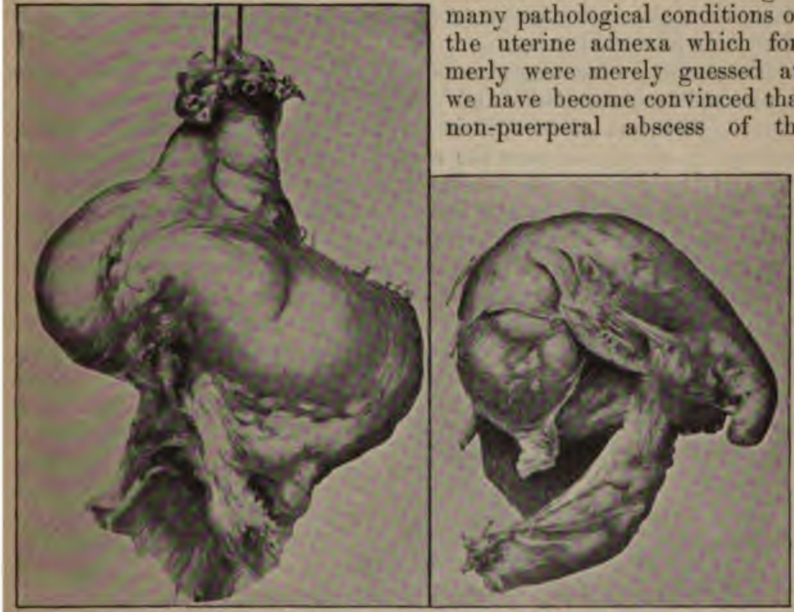
Abscess of the Ovary.

Definition.—An abscess of the ovary means the substitution of a greater or lesser part of the organ by pus in consequence of an acute inflammation.

Pathology.—As already stated in the preceding section, suppurative estruction of the ovarian tissue takes place much more frequently as he result of puerperal inflammation of the organ than in the non-puereral state. Our subject confines us to the latter condition. Usually, cute inflammation of the ovary which is so intense as to terminate in uppuration is accompanied by pelvic peritonitis and more or less exuation in Douglas's pouch. In consequence of this exudation, and the nsuing adhesions with interruptions of circulation, the ovary breaks own and undergoes suppurative destruction. Often a number of ttacks of this kind are necessary before the ovarian tissue succumbs o suppuration.

Frequency.—In former times abscess of the ovary of the non-puereral variety was thought to be exceedingly rare; but at present, when the frequency of abdominal section enables us to investigate many pathological conditions of the uterine adnexa which formerly were merely guessed at, we have become convinced that non-puerperal abscess of the vary is by no means as rare as was supposed. [While the majority f operators report having met with more cases of pyosalpinx or pusubes than of pyo-oöphoron or pus-ovary, I have chanced to see more f the latter, having operated on eight cases during the last few years n which the tube was only secondarily involved. All of the patients, t may be mentioned, recovered.—P. F. M.]

FIG. 300.



Abscess of Both Ovaries, with Pyo-salpinx (Mundé).

The sacs of the abscesses are open, having been torn during their detachment from the adhesions. The dilated tubes are above.

Diagnosis.—The diagnosis is not easy to make. The presence of a elvic inflammation, and even of encysted fluid in the pelvic cavity, is ot difficult; the aspirator inserted *per vaginam* indeed reveals to us hat the fluid is pus, but whether it is pus in the ovary or pus in the

Fallopian tube is not always easy to say. In the cases where we have had opportunity to verify the diagnosis by laparotomy we have found that an abscess of the ovary had a spherical shape, whereas that of the tube was oblong, more like that of a sausage. At times pus is found in both tube and ovary, and then a differential diagnosis is absolutely impossible. To distinguish between an intra-peritoneal abscess and one in the pelvic cellular tissue is usually not so difficult, since the intra-peritoneal abscess can generally be moved slightly on bimanual examination, whereas the pelvic abscess, being in contact with the pelvic wall and outside of the peritoneal cavity, is absolutely immovable. Usually the ovarian abscess is surrounded by adhesions following pelvic peritonitis, and attached by them to the neighboring surfaces of Douglas's pouch or intestine. In this respect also an ovarian abscess differs from a pyo-salpinx, which may be entirely free. The pus of an ovarian abscess may be perfectly sweet and inodorous or quite offensive, probably in the latter case due to adhesion of the intestine and transmission of intestinal gases.

Treatment.—The diagnosis being made of an abscess of the ovary, its removal is at once indicated. There can be no two opinions on this subject. Ovarian abscess, it is true, seldom ruptures into the peritoneal cavity, simply because the adhesions and the inflammatory thickening of the pus-sac do not favor rupture. Still, no one can know when such an accident might occur, and fatal peritonitis will of course be the result. Besides, there is no other cure for the disease than the removal of the pus-sac and its contents. To aspirate, open, and drain it *per vaginam* is admissible only when the sac is adherent to Douglas's pouch. This might be proper treatment if only one ovary were diseased; but if both have become abscesses nothing short of their absolute removal by laparotomy is indicated. This question, however, may still be said to be somewhat *sub judice*, since undoubtedly an abscess of an ovary which is firmly adherent to the bottom of Douglas's pouch can be opened and probably cured by vaginal treatment with much less danger than accompanies its removal by abdominal section. The one objection to the vaginal puncture is always that the after-treatment may be very much prolonged, may eventually fail in effecting a cure, and that laparotomy may ultimately be required. No hard and fast rule can be laid down for the treatment of these cases, each one of which should be judged and treated on its own merits.

CHAPTER XLII.

OVARIAN TUMORS.

To the labors of Rokitansky and Virchow is chiefly due our present complete knowledge of those pathological developments called tumors. Even since the publication of the last edition of this work advances and discoveries have been made which have cleared up certain doubtful points in the histological significance of tumors of the ovary, and we are now able to pronounce authoritative judgment on nearly all the questions concerning the pathology, cause, and prognosis of these growths. As regards their treatment—that is, their cure by removal—but little remains to be discovered, since nearly every phase and variety of the disease has been explored over and over again by numerous operators, who have the "courage of their convictions" based on wide experience.

In order to facilitate the clinical study of ovarian tumors we have presented them in the following table under two chief headings—first, as to their being solid or containing cystic elements, and, second, as to their benignancy or malignancy. We also introduce a table presenting other abdominal pelvic cysts resembling ovarian cysts so closely that a differentiation is exceedingly difficult.

- Ovarian tumors.
  - Solid tumors.
    - Carcinoma;
    - Sarcoma;
    - Papilloma;
    - Fibroma.
  - Cystic tumors.
    - Cysto-carcinoma;
    - Cysto-sarcoma;
    - Cysto-fibroma;
    - Cysto-papilloma;
    - Dermoid;
    - Ovarian cysts, monocystic and polycystic (myxo-adenoma);
    - Hydrops folliculorum.
- Benign tumors.
  - Papilloma;
  - Fibroma;
  - Cysto-papilloma;
  - Dermoid;
  - Myxo-adenoma;
  - Hydrops folliculorum.
- Malignant tumors.
  - Carcinoma
  - Sarcoma
    - Solid;
    - Cystic;
- Solid abdominal tumors resembling ovarian tumors.
  - Pediculated fibroids;
  - Solid tumor of spleen;
  - Displaced kidney;
  - Tumors of abdominal wall; adipose enlargement;
- Abdominal and pelvic cysts resembling ovarian.
  - Cysts of broad ligament;
  - Uterine fibro-cysts;
  - Encysted peritoneal dropsy;
  - Renal, hepatic, and splenic cysts;
  - Parasitic cysts;
  - Hydro-salpinx;
  - Cysts of the omentum, mesocolon, and pancreas;
  - Tubercular peritonitis;

Abdominal and pelvic cysts resembling ovarian.	Cysts connected with the spinal cord; Ascites; Distended bladder; Pregnancy; Pseudo-cysts; Fecal tumor (coprostasis).

Under the head of solid tumors enchondroma and osteoma have been reported, but the authenticity of the few cases noted is very doubtful. Under that of cystic tumors has been mentioned hydrops folliculorum, which sometimes creates a sac as large as a child's head.

CARCINOMA.—The ovary may be affected by several varieties of cancerous deposit, which are here placed before the reader:

1. It may be affected by true scirrhous degeneration. This form of cancer is less common than others, occurs usually after middle life, and may create a tumor of large dimensions. It develops slowly, and presents the physical appearance of scirrhous disease in other organs; it may be a primary malignant development, or it may occur in the ovary secondarily, its primary development having been previously recognized in some other part of the system.

2. The ovary may be the seat of medullary cancerous deposit, which may originate in the vesicles of De Graaf; in a corpus luteum, as Rokitansky once saw it do; or in the stroma of the organ. Distension sometimes causes rupture of the tunica albuginea of the ovary, and then exuberant medullary growth develops in contact with the peritoneum and abdominal viscera.

3. Scirrhous or medullary cancer may alone or united attack the wall of a cyst, and develop either as an endogenous or exogenous production. The cancerous matter so completely invades the cyst-walls in some cases as to make it appear that cystic degeneration had occurred secondarily to its deposit.

4. From the wall of a cyst, vascular, arborescent villi may project, lining the cavity, and in time filling and distending it so as to cause the rupture of its walls. Then the exuberant cancerous element develops in immediate contact with the peritoneum, and produces either a dangerous peritonitis or abundant abdominal dropsy. This is the malignant form of papilloma, known in the cervix uteri as epithelioma or "cauliflower growth." But all papillomatous growths of the ovary are not malignant.

With this form of cancer colloid degeneration is often associated, when it constitutes that variety which has been described by Cruveilhier as alveolar cancer.

The recognition of the fact that the ovarian disease which affects a patient partakes of the character of any one of the forms of cancer just enumerated must ever be a matter of great moment, for upon it must depend not only our prognosis, but in some cases the determination to adopt or reject the operation of ovariotomy. Even if the case be one of malignant disease, however, operative procedure may accomplish good by prolongation of life.

The symptoms which generally point to the malignant character of an ovarian tumor are these:

1. The rapid development of a solid tumor in an ovary, with—
2. Marked depreciation of the strength, vital forces, spirits, and general condition of the patient.
3. The occurrence of œdema pedum and spanæmia with a small tumor, which are consequently dependent upon a general blood-state, and not the results of pressure by the tumor.
4. Lancinating and burning pains through the tumor.
5. Cachectic appearance.
6. The occurrence of ascites without evidences of cirrhosis or other hepatic disease, organic disease of the kidneys or heart, or chronic peritonitis.

Cystic degeneration of the ovary sometimes advances with great rapidity, and is accompanied in its course by rapid emaciation, marked physical prostration, ascites, and a cachectic appearance. It may be asked whether a case thus complicated would not present the very conditions which have been pointed out as furnishing grounds for the diagnosis of malignant disease. Unquestionably, it would. Let it be remembered that while these symptoms are mentioned as valuable aids to diagnosis, we do not pretend to maintain that they will always enable the diagnostician to avoid error. Again, in citing ascites with a solid tumor as a most important symptom of malignant ovarian disease we do not allude to slight or even moderate effusion with a large growth, but a markedly disproportionate amount of fluid—a great deal of abdominal effusion with a very small tumor.

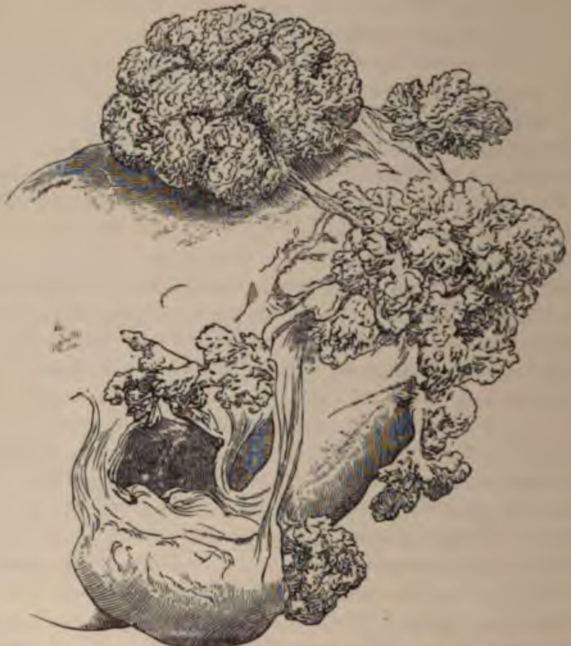
Besides the condition just mentioned, there are two others which may create difficulty in differentiation from ovarian cancer: one is pregnancy in the middle or latter months, complicated by peritoneal effusion; the other a uterine fibroid existing with attendant dropsy. The first may generally be known by its characteristic symptoms; while the second, although it might be recognized by the physical and rational signs of uterine fibroids, would very likely give considerable trouble in diagnosis.

When difficult and obscure cases present themselves in which a positive diagnosis becomes impossible by ordinary means, paracentesis, explorative incision, or both, should be resorted to rather than that the patient should be deprived of the prospect for cure held out to her by ovariotomy. Very often the most doubtful case may be satisfactorily settled by evacuating the abdominal effusion, and passing the index finger or the hand through a small opening in the peritoneum so as to touch the morbid growth. In certain rare cases even this would not suffice to remove all doubt.

By the means mentioned we have succeeded in making a correct diagnosis in many cases of true ovarian cancer, but in relying upon them we have several times failed entirely, pronouncing as cancer what afterward turned out to be benign growths. Cystic ovarian tumors (especially those distinguished by papillomatous excrescences on their surfaces) may unquestionably produce excessive ascites and all of the other rational signs which we have here recorded as evidences of cancer.

Fortunately, we are not called upon now to rely upon these imperfect means. A very valuable addition to our means for diagnosticating

FIG. 301.



Papillary Cystoma of the Ovary, with perforating papillomata (Olshausen).

carcinoma of the ovary has recently been put at our disposal by Drs. Foulis of Edinburgh and Thornton of London, each working without knowledge of the other's labors. They have found that if the peritoneal fluid which has been in contact with malignant ovarian tumors be examined microscopically, it will be very generally found to contain germs which will announce the fact and put us on our guard as to the nature of the disease. Their statements may be found in the *British Medical Journal* for July and September, 1877, and are well worth careful study.

SARCOMA is another variety of malignant disease affecting the ovary. It is less common than carcinoma, and is usually of the spindle-celled variety, with more or less admixture of round cells. Sarcoma of the ovary may exist alone, or it may invade myxoid cystomata (the ordinary ovarian polycyst), or carcinomata and fibromata. In this combination the tumors may grow enormously large, and the malignant degeneration spread to neighboring organs or to distant portions of the body by metastasis. Both ovaries are often affected. Progress is less rapid than carcinoma, but equally certain. Early removal may, however, effect a cure.

PAPILLOMA.—The hypertrophy of papillæ may take place from the surface or from the wall of a glandular cyst, and at an early stage does not denote malignancy. It is simply a warty growth, like that disease in other parts of the body. The stroma of the ovary may have undergone more or less cystic development, or the ovary may be scarcely larger than normal. [I have seen such papillomatous excrescences on the outside and inside of large cysts, their size being often as large as a fist; and in one the ovary, of normal size, was studded with small warts. These papillomata may spread to the neighboring organs, and in one case, masked by ascites, in which I made an exploratory incision I found ovaries, uterus, bladder, and rectum all inextricably involved in one mass of papillomatous growths, which also spread to the pelvic wall. An attempt to detach and isolate the different parts of the mass resulted in profuse hemorrhage, and was abandoned. The abdominal cavity was flushed with warm water, a drainage-tube inserted, and the wound closed. The tube remained in place two weeks, and, there being then no more secretion, was removed. The patient made a good recovery, and when seen a year later was free from ascites, although the tumor was apparently unchanged. Her physician reports to me, four years after the operation, that she is apparently perfectly well, and that the tumor has become hard.—P. F. M.]

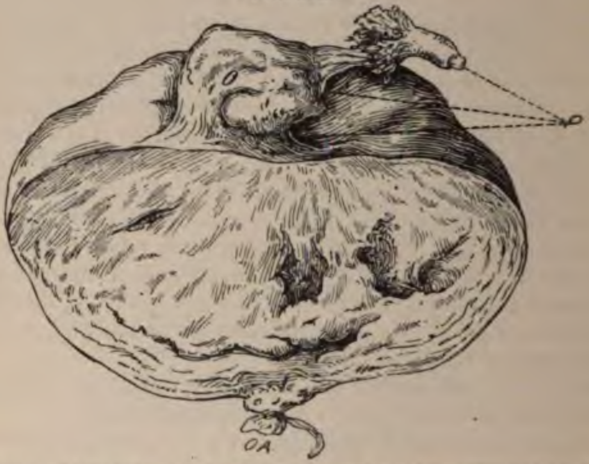
Although these papillomata are not malignant at the outset, there is no certainty that they may not at any time become so.

FIBROMA.—This form of tumor is rarely met with in the ovary, and never attains a very great size. Nearly all the cases of fibrous tumor of the ovary reported in former times were errors of diagnosis, usually being merely uncommonly solid multilocular cysts of that organ, which to the touch felt like solid tumors. Thus, Peaslee in his classical work on *Ovarian Tumors* (p. 26) reported one removed by Thomas, who, however, in the last edition of this work disagrees with Peaslee's diagnosis, on the ground that the tumor "consisted of loose fibrous elements, forming numerous loculi, about the size of a hickory-nut, which were filled with honey-like material." It was evidently a myxo-adenoma, composed of innumerable small cysts, which we all see very frequently, and the nature of which is well known to us at the present day. The custom of calling these multilocular cysts with considerable solid tissue "cysto-fibroma" and "cysto-sarcoma," which obtained in those days, added to this confusion. True fibroma of the ovary occur in a limited number of cases, every operator of prominence having probably seen one or two. Their size usually does not exceed that of a child's head, but Foerster, Van Buren, Thomas, Spencer Wells, and others have each removed one larger than an adult head. [I showed one weighing 773 grams, or about 1½ pounds, to the N. Y. Obstet. Society two years ago, removed by me from a single lady twenty-six years of age, and in the discussion Dr. Coe stated that there were only thirty or forty on record, he having, as pathologist to the New York Woman's Hospital, seen about half a dozen.

Fibro-cysts—and mine was just beginning to undergo that degeneration—of the ovary, according to Dr. Coe, are even more rare than fibroids, the only one he had seen being one removed by Dr. Thomas, containing a quart of fluid. At this meeting mention was made of a fibroid of the ovary removed by Dr. H. M. Sims, and of a fibro-cyst of the ovary removed by Dr. Wylie.—P. F. M.]

Fibroids of the ovary were met with twice in 500 ovariotomies by Spencer Wells. Either the whole ovary may have undergone the fibrous degeneration, or [as in my case and one reported by Olshausen —P. F. M.] the fibroma sprang from a comparatively small point on the surface of the ovary, possibly having developed from a corpus luteum, as is suggested by Klob, Klebs, and Rokitansky. Ovarian fibroids usually grow slowly, but cause more pain and excite ascites more early than ovarian cysts of corresponding size. Their pedicles may be twisted and alarming symptoms arise, to be referred to later on, when torsion of the pedicle of the ovarian cysts will be considered.

Fig. 302.



Fibroma of Ovary just beginning to undergo cystic degeneration (Mundé).
P, pedicle; *OA*, adhesion.

The *diagnosis* is difficult, a pediculated myo-fibroma of the uterus being the one thing for which the ovarian fibroid is most easily mistaken. The greater amount of pain and the failure to find the ovary on that side may aid in the diagnosis. Bilateral fibromas of the ovary are reported by Spengler and Winckel.

Early removal by laparotomy is the only treatment indicated.

If in one of the solid tumors just mentioned cysts develop themselves as essential parts of the growths, we give them the names of cysto-fibroma, cysto-sarcoma, or cysto-carcinoma.

CYSTO-CARCINOMA.—The formation of fluid collections may occur with cancer of the ovary in three ways: 1st, cysts may develop in the structure of scirrhous and medullary cancers, as they do in that of sarcomata; 2d, a fluid or cystic tumor, primitively benign, may develop malignant material in its cyst-wall; 3d, a large medullary cancer may, by cell-infiltration and disintegration at its centre, form within itself a mass of fluid. The condition may consist then in cancer complicating cystic degeneration or in cystic degeneration complicating cancer.

According to Scanzoni, the cancerous mass may develop in the tissue of the cyst-walls and project either internally or externally, or it may grow from the walls by pediculated or sessile tumors filled with medullary material, which are soft, tumefied, and very vascular. In the same tumor both colloid degeneration and medullary cancer may be met with.

The ovarian limits do not always confine these fatal growths. At times they pass them and affect the peritoneum or other neighboring parts. This tendency to eccentric development accounts for the protuberances, the size of the fist, so often serving as a means of diagnosis of ovarian cancer. The distinguishing characteristic of cystic cancer is its rapidity of development. In a few months it often reaches a size which sarcoma or even cystic degeneration would not attain for several years.

Surgical treatment holds out little hope in these cases. According to our experience, ovariotomy performed upon patients thus affected almost invariably results fatally. Nevertheless, even as a forlorn hope its propriety should be considered.

The prognosis in this disease is graver and the limit of life shorter than in any other affection of the ovaries.

Cysto-Sarcoma of the ovary means nothing more than the association of a sarcomatous degeneration of the organ with cystic formation, either the sarcoma or the cyst being the first to develop. Much confusion formerly existed in these nomenclatures, the word "sarcoma" (from *σαρξ*, flesh) being used to indicate the presence of more or less solid elements in the polycystic tumor. At one time, indeed, these tumors were considered to be malignant or bordering on malignancy. Now, however, we know that these growths are composed of glandular and papillary tissue, with epithelial and connective tissue and vessels, and contain numerous large and small cavities filled with thick and thin, clear and opaque, fluid and colloid matter. But they are not malignant, and, to avoid the old confusion, are no longer called "cysto-sarcoma," but "myxo-adenoma," or glandular growths filled with mucus-like secretion.

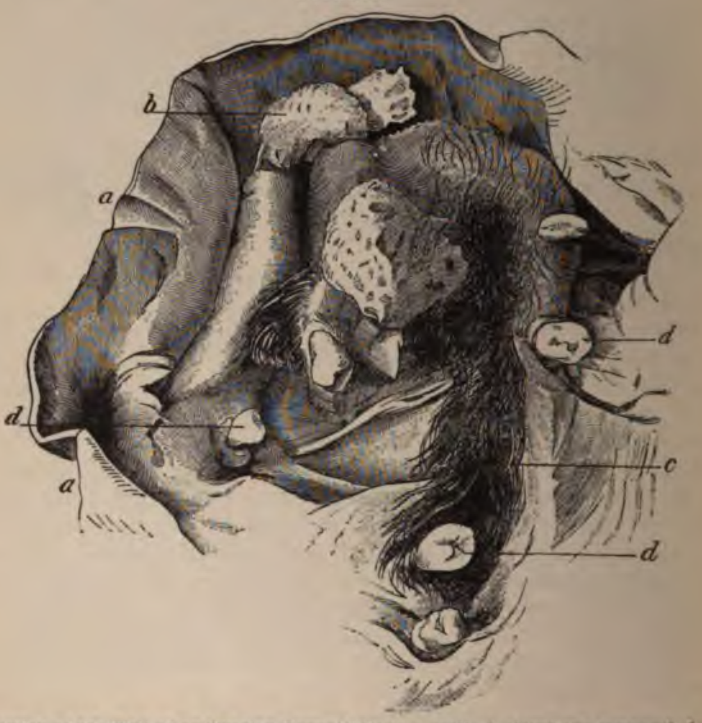
True cysto-sarcomata may, like all malignant growths, rapidly assume a very large size. But the cases reported in the older books by this name as instances of enormous growth were undoubtedly common non-malignant ovarian polycysts.

Cysto-sarcoma of the ovary is, we believe, by no means as common as cysto-carcinoma. The same rule applies to this variety as to all ovarian tumors—viz. the earlier removal by abdominal section, the better the chances of the patient for recovery. If the sarcomatous degeneration has already spread to neighboring organs, of course permanent recovery is out of the question.

Cysto-Papilloma and Cysto-Fibroma have already been briefly referred to under Papilloma and Fibroma, and need not be further discussed here. The development of papillomata on the interior of ovarian cysts will be again mentioned later on.

Dermoid Cysts.—In various parts of the body, the orbit, the floor of the mouth, the brain, the eye, the anterior mediastinum, the lungs, the mesentery, the testicles, and the ovaries, a peculiar cyst containing fat, teeth, hair, cholesterin, cartilage, and bone is sometimes found. Its wall gives evidences of the existence of sweat-glands, sebaceous follicles, papillæ, and an investing epithelium, so that the microscopic appearances of the wall resemble closely those of the skin. Many fanciful theories have been indulged in as to the origin of these peculiar growths. It is now generally believed that they are the result of an irregular and eccentric development of the tissues of the fœtus during intra-uterine life. It was Lebert who advanced the theory that from the elements present spontaneous generation of a portion of skin occurs, and this being given, we have, as Dr. Farre expresses it, "the basis out of which many of those products spring."

Fig. 303.



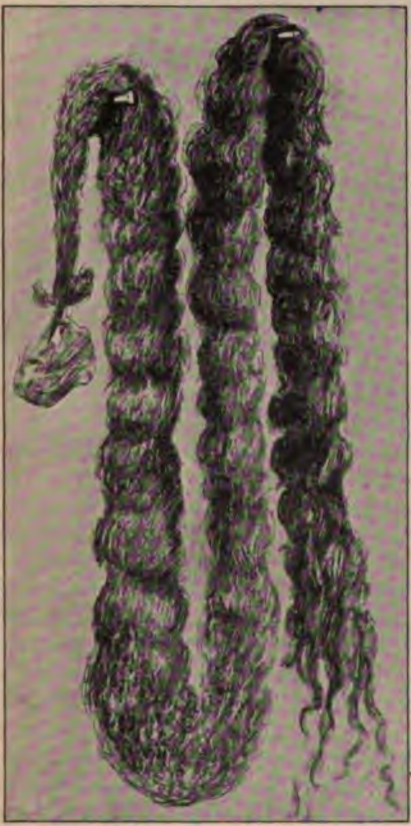
Portion of the Wall of an Ovarian Dermoid Cyst: *a*, wall; *b*, elevations composed of fatty and cutaneous tissues; *c*, hairs; *d*, teeth (Ziegler).

M. Pigné has analyzed 18 cases with reference to the period of life at which they were found, with the following results:

5 existed in virgins under twelve years;
6 " children from six months to two years;
4 " the female fœtus at term;
3 " fœtuses cast off at eighth month.

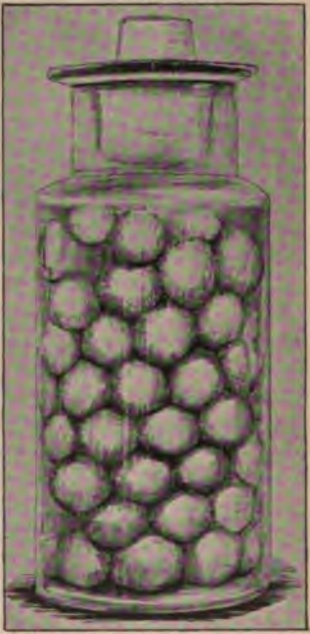
Dermoid tumors vary in size from that of a hen's egg to that of the adult head, but very rarely grow larger. They are hard and generally globular. One ovary is usually affected, and by only one tumor, but instances are on record where a single ovary contained a large number. They usually consist of fat, long hairs, teeth, skin, and traces of bone intermixed. The teeth are usually imbedded in the cyst-wall or attached to pieces of bone, and are sometimes very numerous. Schnabel[1] records a case in which they exceeded one hundred in number, and Ploucquet[2] one in which they amounted to three hundred. [Out of 15 cases of dermoid cysts operated on by me, in 3 both ovaries were affected in this manner. One of these three women was pregnant five months; from another, a single woman, thirty-nine years of age, I removed the switch of hair shown in the adjoining diagram. When removed it was two and a half feet long, but after dissolution of the fat contained in it by immersion in ether, it lengthened to five and a half feet, being nearly as thick as the arm at the wrist in its entire length. From another came the peculiar bullets of fat shown in Fig. 305, each ball containing a single hair—P. F. M.]

FIG. 304.



Switch of Hair, five and a half feet long, from Dermoid Cyst (Mundé).

FIG. 305.



Balls of Fat from Dermoid Cyst (Mundé).

Although in themselves innocuous, and not likely to increase rapidly or to attain any great development, they sometimes set up very serious and even fatal disturbance by one of three methods:

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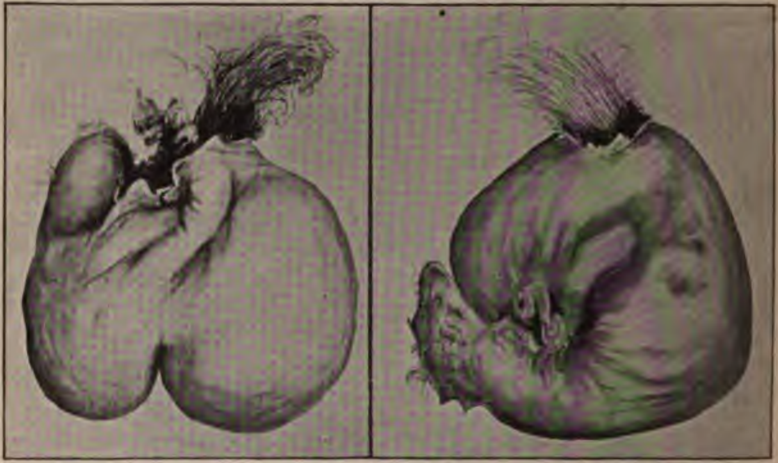
[1] Kiwisch, *op. cit.*

[2] Becquerel, *op. cit.*

by creating suppuration and abscess on account of the irritation kept up by a foreign mass; by perforation and discharge into the peritoneum; or by the cyst which contains the dermoid elements secreting fluid and changing its character to that of a fluid tumor. [Out of 150 ovarian tumors removed by me, 4 were large cysts having as bases dermoid tumors containing fat and hair, and in 1 case a small fragment of bone. In these cases the cysts containing the dermoid elements were not in communication with the large cysts filled with fluid colloid which constituted the mass of the tumor. In 2 cases the tumor was nearly removed when a cyst filled with fluid, fat, etc. was opened into. The large cysts appeared exactly like ordinary multilocular cystoma.—T. G. T.]

FIG. 306.



Double Dermoid Cysts, removed during pregnancy: recovery (Mundé).

Very often they are discovered by accident only. Physical exploration reveals a hard, round mass, often painful upon touch, and, unless the size prevent it, perfectly movable. But more frequently their tendency to inflame spontaneously produces pain and even an elevation of temperature, which leads to their discovery, or their pedicle becomes twisted, or they are bruised accidentally, and then detected by examination. In one case, reported by Dr. Janvrin to the New York Obstetrical Society (see *Am. Journ. Obst.*, vol. xix., 1886), the patient's attention was first attracted by a bunch of hair protruding from the rectum. This, after repeated efforts, she pulled away. Some years later her abdomen began to enlarge, two ovarian tumors were diagnosed, and on removal found to be both dermoid, one of which had perforated into the rectum. Pelvic abscesses have been frequently witnessed (several times by P. F. M.), the intra-peritoneal and dermoid character of which was proved by the removal of hair through the sinus of the supposed abscess in the posterior vaginal vault.

Dermoid cysts of the ovary should be removed by laparotomy as soon as discovered, although it is true that the diagnosis can usually not be made until after their removal. If we were to find a small tumor, of the size of a duck's egg to a cocoanut, in the pelvic or lower abdominal cavity, which was more or less tender on pressure, and had a tense, almost solid feel, we should feel inclined to hazard the guess that it might be a dermoid, and advise early removal, for fear of torsion of the pedicle or inflammatory adhesions.

In our experience there are three chief periods in female life which seem to excite the dormant growth of dermoid tumors of the ovary: 1, puberty; 2, marital relations; and 3, pregnancy and parturition.

Laparotomy for dermoid cysts is relatively as successful as for ordinary ovarian cysts. The contents of dermoid cysts, unless suppuration has occurred, are no more irritating or infectious to the peritoneum or womb than the fluid of ordinary ovarian cysts.

We have now reached the proper point for the consideration of the subject of ovarian cysts and cystomata which calls, on account of its paramount importance, for the closest investigation on the part of the gynecologist. That it may receive this we leave its study for a separate chapter.

Before proceeding, we wish to clear up any possible doubts which may still exist, not only as to the exact pathological status of cystosarcoma of the ovary, which we have distinctly pronounced malignant, but merely on account of the malignancy of its sarcomatous elements, not because tumors composed of both solid and fluid constituents need necessarily be malignant; but we also wish to disabuse the reader of any possible misconception he may have as to another old term—viz. "colloid." This word is derived from χολλα, "glue," and ειδος, "like," and that is all it really means. Multilocular ovarian cysts containing this colloid or glue-like matter were formerly thought to be, if not actually malignant, at least on the verge, and the "colloid" character was supposed to be the proof. Even in the last edition this peculiar matter—due, it is believed, to the breaking down of the stroma of the organ into alveoli—was pronounced "not in itself a malignant affection, but one which seems to contribute a connecting link between cancer and the benign degenerations." At present, however, we are entirely assured that this colloid matter, whilst it may occur with cancer, is in no way associated with malignancy, but practically important only in that it is more difficult to evacuate, and may necessitate a longer incision to enable the only partly emptied tumor to be delivered.

In conclusion we will quote the words of Virchow[1] on this point: "You may say colloid cancer, colloid sarcoma, colloid fibroma. Here 'colloid' means nothing more than jelly-like."

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[1] *Cellular Pathol.*, p. 512.

CHAPTER XLIII.

OVARIAN CYSTS.

THIS disease consists in the development of cysts within the ovary without coincident growth of solid elements, such as fibroma or carcinoma. Of all the varieties of ovarian tumor, it is the most commonly met with, and hence for the practitioner it is the most important. It is, fortunately, too, that which above all others is most susceptible of relief by surgery.

Pathologists are still at variance with reference to the origin of ovarian cysts. While some with Wilson Fox[1] agree that "all the forms of cysts met with in the ovary originated from the Graafian follicles, and that the multilocular forms are not the results of any special degeneration of the stroma," others, like Wedl, doubt their follicular origin entirely, and others still, with Rindfleisch, admit two different sources of cystic formation—one the follicles, the other the interstices, of the stroma.

"In many cases," says Rokitansky,[2] "they are undoubtedly formed from the Graafian follicles, and it appears that an inflammatory process is particularly liable to give the first impulse to this metamorphosis. They are probably, however, as often new formations from the beginning."

"It was formerly very generally supposed," says Wedl,[3] "that the cysts in the parenchyma of the ovary originated in the Graafian follicles, but no direct proof of this was ever given."

Lücke,[4] one of the latest and most reliable authorities, takes even stronger ground against it than Wedl did. After quoting Rokitansky's views, he goes on to say: "But we have already stated that cysts can only form in the connective tissue and only after a long-continued irritation, and that it does not look at all probable that such cysts should form by spontaneous exudation. As far as the cystoids of the ovary are concerned, theory certainly is not admissible. These tumors are essentially cysts from broken-down tissue."

While experimental pathologists are testing this question we may for the time assume that there are two entirely different pathological processes by which true ovarian cysts are generated:

1st. The follicles of De Graaf become filled with a colloid material, due to abnormal secretion from their walls, and, according to Rokitansky and Rindfleisch,[5] probably the result of inflammatory disease of the wall of the follicle. This is not the insignificant hydrops folliculorum which creates small cysts, but a true colloid degeneration of the follicle of much more serious import.

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[1] *Med.-Chirurg. Trans.*, 1864.

[2] *Op. cit.*, p. 249.

[3] Wedl's *Path. Histol.*, p. 462.

[4] Chapter on Tumors in Billroth and Pitha's *Manual of General and Special Surgery*.

[5] *Op. cit.*, p. 515.

2d. A development of cysts may occur in the stroma of the ovary without connection with the follicles. In this case, according to Wedl, "the cyst consists in an excessive augmentation of volume of the areolæ of the areolar tissue and of the papillary new formations composed of connective tissue." In this view Waldeyer coincides in his excellent treatise on the ovary.[1]

Lücke makes Rokitansky's view as to the mode of formation of these cysts in the stroma so clear that we use his words instead of quoting the original: "Cysts may also be generated by exudation into new-formed connective tissue—the fluid distending the different bundles, and as they intersect in all directions, the globular form is the result; thus numerous small spaces communicate with each other, from their walls new cysts start, and thus very complex tumors can be formed." Rindfleisch[2] accepts both of these sources of ovarian cystoma in the following words: "An exact investigation also proves that at least the majority of all ovarian cysts proceed from Graafian follicles; while, on the other hand, until further information, a different mode of origin must be accepted for a group of cysts, although not so large, yet at the least just as important."

The development of a substance resembling the glandular element of the ovaries, and constituting the nidus of cysts, has recently attracted considerable attention. In 1862, Sir Spencer Wells proposed for this the name of "adenoma" or "adenoid tumor." Further investigations appear to have satisfied pathologists that a degree of adenoid development occurs in every true ovarian cystoma. Wells himself, in his work on *Diseases of the Ovaries*, considers under the head of adenoid tumors all simple, multiple, and proliferous cysts; and Delafield[3] declares that "in the ovaries most of the compound cysts are adenomata, with dilatation of the follicles." Klebs strongly advocates this view. As adenoma is, then, a frequent element of ovarian cystomata, it requires no separate and special consideration.

Until a recent period considerable attention has been paid to the character of ovarian cysts, based upon the existence of a few and of many cysts. Pathologists are beginning to lay less stress upon this feature than they formerly did. Rindfleisch declares that all are multilocular in the beginning, and that they become paucilocular, and even, in rare cases, unilocular, by fusion of adjacent cysts by breaking down of dividing septa. It must be admitted, however, that there is one class of tumors the distinguishing characteristic of which is the existence of a few cysts only, one or two of which are usually very large, and another which is specially marked by numerous small cysts. The first constitutes the oligocystic tumor of Peaslee; the latter the polycystic tumor; or, as they are likewise styled, paucilocular and multilocular.

Each class has usually certain well-marked features, the recognition of which is of value in a practical point of view. The first is thus described by Rindfleisch: "Multilocular tumors up to the size of a man's head, or unilocular cysts up to two feet in diameter, with smooth but little adhering surface, and comparatively thick, fibrinous walls, which are very commonly covered at their inner side with cauliflower-like or more tuberous papillary excrescences." This is the form of tumor which he regards as due to colloid degeneration of the Graafian follicles.

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[1] Waldeyer, *Eierstock und Ei*, Leipzig, 1870.

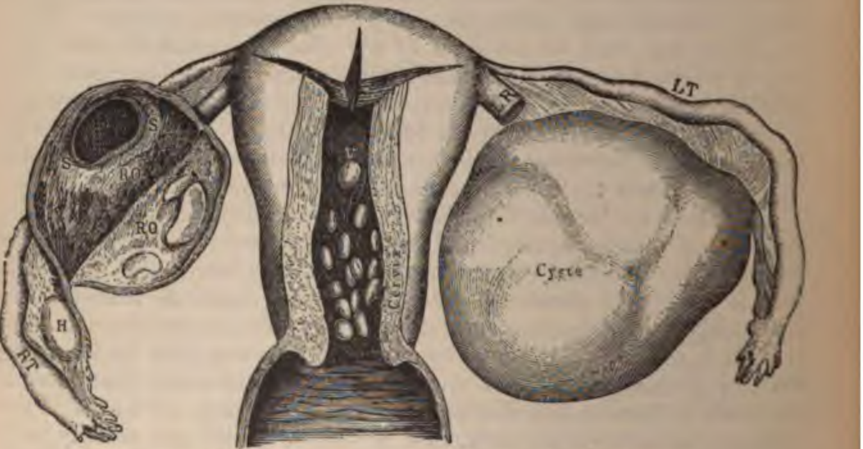
[2] *Op. cit.*, p. 515.

[3] *Post-mortem Examinations and Morbid Anatomy.*

The second variety he describes in these words: "At the place of one ovary (the other, as a rule, is healthy, while in the first form the disease is often of both sides) there lies a tumor not infrequently far above the size of a man's head, which is composed of several large and very many smaller, and even the smallest, cysts. The larger cysts are often constricted, and exhibit at these places the remains of former partition-walls in the form of fenestrated membranes or ramified vascular strands, which evidently succumb to a gradual maceration. The surface of the tumor is probably always connected with the peritoneum by a large number of inflammatory adhesions, upon which larger venous vessels run to and fro. The walls of the cysts are comparatively thin and easily torn." These tumors he regards as due to colloid degeneration of the stroma.

While the statement of Rindfleisch, that no "fundamental significance" can be attributed to the unilocular or multilocular character of these tumors, is correct from an anatomical point of view, it is not the less so that the practitioner is greatly aided in prognosis and treatment by a recognition of the difference between the two forms of tumors just described, and also that which exists between them and another, which, being composed of both cystic and solid elements, receives the name of compound. We therefore proceed to consider the varieties of these growths in reference to the points mentioned, and to recapitulate succinctly what has been already said.

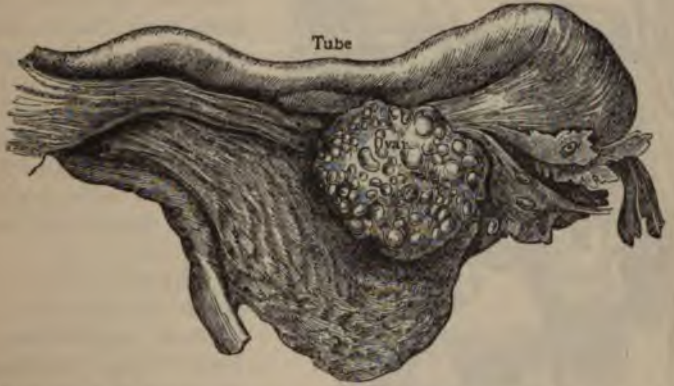
FIG. 307.



Monocyst of Left Ovary: glandular degeneration of cervical mucosa.
LT, left tube; RT, right tube; V, large uterine glandular polypus; LR, left round ligament; RO, right ovary; SS, small cyst in right ovary; H, small cyst of broad ligament (natural size; Beigel).

Our idea of the true character of the majority of ovarian cysts is, that they represent a more or less uniform enlargement of every portion of the affected ovary, one element often predominating over another, but all being to some extent involved. Thus, in one case the Graafian follicles naturally present in a normal ovary become distended, some more, some less, and the tumor then consists of thousands of cysts of greater or lesser size; at the same time the walls of these cysts may remain thin or may develop in thickness proportionate to the dimensions of the cyst. Vessels, lymphatics, nerves, epithelial lining, and papillary protuberances keep pace with the development of the rest of the organ, and, as there is no apparent limit to that development, we find ovarian tumors containing all the component parts of the parent organ developed to their utmost capacity. But this is not always the case, since one element often predominates over the other in the process of morbid development, and one ovarian tumor consists almost entirely of one sac or a combination of cysts, with but very little solid material; whereas another presents more solid than fluid constituents; and a third, again, is composed entirely of the solid elements of the ovarian stroma. The proper name, then, for these different forms of ovarian tumors is adenoma, meaning more or less uniform development of the ovarian glands. According as the contents of the cysts are fluid, which is usually the case in oligocystic tumors, they are called cysto-adenoma; or, if the contents are thick, as in multilocular tumors, myxo-adenoma. The latter we would consider the generic term for ovarian cysts.

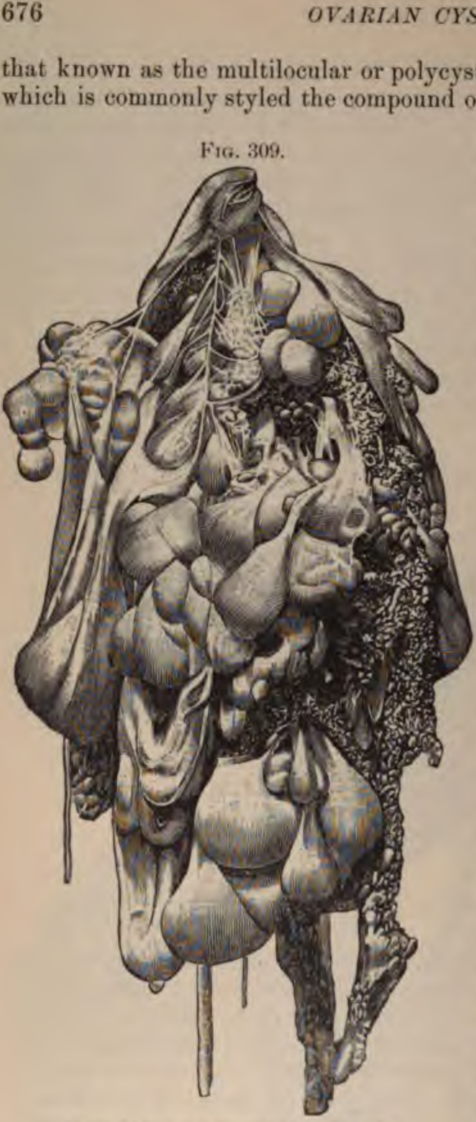
FIG. 308.



Cystic or Vesicular Degeneration of the Ovary: Hydrops Folliculorum (Beigel).

Ovarian cysts are characterized by three marked features: first, cysts with one or very few large compartments; second, cysts with a great many small compartments divided by thin cyst-walls or thick trabeculæ; and third, cysts which are composed of solid and fluid elements in varying proportions. The first constitute the class styled the monocystic, unilocular, paucilocular, or oligocystic tumor; the second, that known as the multilocular or polycystic tumor; and the third, that which is commonly styled the compound ovarian tumor. "All cystoids are multilocular at the commencement," says Rindfleisch, but unilocularization, he declares, is especially frequent in those tumors arising from colloid degeneration of the Graafian vesicles. A true monocyst is rare, though it may grow to the size of the uterus in the ninth month of pregnancy. Monocysts will usually spring from one Graafian follicle, or possibly from several which have become united during their development. The fluid is always limpid, and very much resembles that of cysts of the broad ligament. We have seen several which attained the size of an adult head.

FIG. 309.



Multiple Ovarian Cystoma (Rokitansky).

The walls of ovarian cysts consist of a covering of columnar epithelium, the proper tunic (tunica albuginea) of the ovary, and an epithelial layer. These walls sometimes undergo great hypertrophy, in rare cases being half an inch thick.

The size to which ovarian cysts will grow is truly wonderful. It has been already stated that unilocular or monocystic tumors are rarely seen of very great size, but instances are on record of multilocular tumors containing over one hundred pounds of fluid. Goodell removed one weighing 112 pounds, with recovery, and Dr. L. A. Rodenstein reported one to the New York Obstetrical Society in 1878 (see *American Journal of Obstetrics*, 1879, p. 303) in which the weight of the tumor removed after death—a previous operation having been refused—was 146 pounds. Tumors of this size have since been reported by several other operators, and nowadays the mere size of an ovarian tumor, while it may attract attention, does not necessarily increase the danger of the operation nor lessen the chances of recovery.

One or both of the ovaries may be affected.

Old statistics would seem to prove that the right ovary is more frequently affected than the left; but, while we have, to our knowledge, no modern figures to contradict these statements, our own experience leads us to doubt whether there is any difference, more than a merely accidental one, between the two ovaries. If anything, we should expect the left ovary, which is acknowledged to be more frequently inflamed than the right, to be therefore more likely to undergo cystic degeneration. [As a slight proof that there is very little difference between this disease of either ovary, I will mention that of 68 operations by me for plain ovarian tumors, I found 27 to be of the left, 28 of the right ovary, and 13 of both ovaries together.—P. F. M.]

Contents of Ovarian Cysts.—This subject has been exhaustively investigated by Scherer and Eichwald.[1] By the latter it has been so minutely dealt with that little is left to be desired as to the chemistry of such fluids.

These contents vary very much, between a clear, albuminous, serous fluid and a thick, gelatinous material which will flow through no canula and has to be manually removed. The specific gravity may be as low as 1007, though usually it is 1018 or 1020. The most important chemical constituent is an albuminate termed colloid, which is usually more dense in polycystic than oligocystic tumors, and denser in small oligocysts than in the same after having assumed a large size. Tapping appears to increase the density of this fluid in oligocysts.

According to Eichwald, two chemical transformations go on in the fluids of cysts simultaneously. Colloid material changes into muco-peptone, while the albuminates transuding from the blood are converted into albumino-peptone. A species of digestion of the raw material goes on under the heat of the body, as Rindfleisch expresses it, and consequently the larger and older the tumor the more fluid are the contents likely to be. Eichwald found these fluids chemically to consist of the following elements:

- Of the mucous order:
  - Substance of colloid particles;
  - Mucin;
  - Colloid substance;
  - Muco-peptone.
- Of the albuminous order:
  - Albumin (and fibrin);
  - Paralbumin;
  - Metalbumin;
  - Albumino-peptone (and fibro-peptone).

As an example of the quantitative analysis the following from one of Eichwald's cases will serve. 1000 parts contained—

Water	931.96
Organic substances	59.77
Débris	8.27
	1000.00

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[1] *Würzburger medizinische Zeitschrift*, 1864.

The débris (8.27) contained—

Salts soluble in water		7.53
Potas. sulph.	0.08	
" chlor.	0.59	
Sodæ nat.	6.29	
" phosph.	0.16	
" carb.	0.38	
Loss	0.03	
Salts insoluble in water		0.74
		8.27

Test for Paralbumin.—Leave the fluid at rest in a cool place, filter or decant, and thus separate sediment from supernatant fluid. Pass a stream of carbonic acid gas through this fluid, and instantly a precipitate of fine flocculi of paralbumin will occur.

Test for Metalbumin.—Digest another part of this fluid with absolute alcohol for three days. Filter off the precipitate and heat with distilled water. Filter again, and metalbumin may be precipitated by sulphate of magnesia. Paralbumin is precipitated from this fluid by a few drops of dilute acetic acid and redissolved by an excess.

To the naked eye the fluids of ovarian cysts present various appearances, as they are tinged with blood or pus from hemorrhage or suppuration of the cyst-walls. The varieties generally met with are the following: a light-colored fluid like barley-water; a light-brown fluid like infusion of linseed; a dark red, bloody-looking fluid; a greenish-yellow, semi-solid gelatin; a purulent fluid of very offensive character, closely resembling pea-soup in appearance; very rarely an intensely black fluid; and in dermoid cysts a grumous, gruel-like mass resembling pea-soup, which at times is thick like putty or yellow lard.

Does a true ovarian cyst large enough to call for surgical interference—that is to say, larger than the size of a child's head, to which hydrops folliculorum sometimes attains—ever contain fluid free from albumin? This is evidently a question of a great deal of importance. Wells[1] and Barnes make three groups of ovarian fluid, the first of which they declare are devoid of fat and albumin. "Heat and nitric acid," says the former, "will neither coagulate nor precipitate them." Peaslee[2] expresses himself in these words: "The fluid of an ovarian cystoma will probably always be found to contain albumin if it be limpid enough to flow through the fine tube of the exploring trocar." We can safely say that we have never met with a true ovarian fluid which did not contain albumin.

The solid elements of the fluid of ovarian cysts consist of the results of hemorrhage and desquamation and fatty degeneration of epithelial structures. In them are found cholesterin, fat-globules, blood-corpuscles, and pigment-cells.

Microscopical Appearance of Ovarian Fluids.—The thinner, serous fluids present in comparison with those of colloid character few cellular elements. In the latter, under a power of from 300 to 550, Eichwald[3] found such an amount of morphological elements that the fluid had to be diluted with water before it could be examined. He then found fatty elements of various size; round cells, some serrated; large, colloid cells; round cells similar to the pyoid bodies of Lebert or the exudative corpuscles of Henle; globular aggregations varying in size; scales of horny epithelium; crystals of cholesterin; dark-brown pigment, etc.

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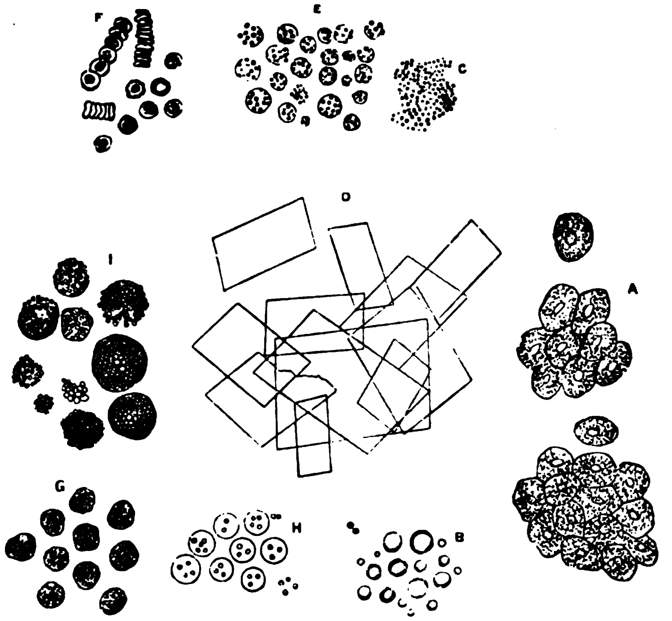
[1] *Dis. of Ovaries*, Am. ed., p. 92.

[2] *Op. cit.*, p. 116.

[3] *Op. cit.*

"On placing a drop of the fluid removed from an ovarian cyst under the microscope," says Drysdale,[1] "we usually find a number of granular cells, E, some free granular matter, C, and small oil-globules, B; and frequently, in addition to these, epithelial cells of various forms, A, and crystals of cholesterin, D. These, together with blood-corpuscles, F, the inflammatory globules of Gluge, I, the pus-cells, G H, and disintegrated blood and other cells, may all be sometimes seen floating in either a clear or a turbid fluid."

Fig. 310



Microscopic Appearance of Ovarian Fluid (Drysdale).

For the microscopist and pathologist all these are of interest. For the ovariotomist this is the chief point of importance: Is there any characteristic pathognomonic cell or element upon the presence of which a positive diagnosis of ovarian cyst may be based? When this question can be unreservedly answered in the affirmative, a great advance will have been made in this important matter. Spiegelberg, in an interesting lecture on the diagnosis of ovarian tumors, enumerates cylindrical epithelium, colloid cells, cholesterin, etc., and appears to rely upon the character of cells furnished by the part from which the material was secreted rather than upon any particular cell.

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[1] *Op. cit.*

Long ago Nunn pointed out the existence of the "gorged granule," though not as a diagnostic point, and Paget, Bennett, Gluge, and others speak of the "granular corpuscle," the "compound granular cell," and the "inflammation-globules." In an essay already referred to Dr. T. M. Drysdale of Philadelphia has recently described a cell which he calls "the ovarian granular cell," which, when found in pelvic tumors, he regards as pathognomonic of ovarian disease, and as such he looks upon its diagnostic value as very great.

The cell of Drysdale is represented in Fig. 310, under E. It is a granular cell, generally round, sometimes slightly oval, very delicate, transparent, and contains a number of fine granules, but no nucleus. The granules have a clear, well-defined outline. These cells may differ in size, but the structure is always the same. The size usually met with is that of a pus-cell. The addition of acetic acid causes the granules to become more distinct. When ether is added, the granules become nearly transparent, but the appearance of the cell is not changed. The cells with which this peculiar corpuscle may be confounded are the pus-cell, lymph-corpuscle, white blood-cell, and other cells which resemble them. The appearance of the ovarian corpuscle is to the experienced eye a sufficient means of distinction, without the addition of acetic acid recommended by its discoverer. Drysdale does not assert that the discovery of this cell is original with him, since Lionel Beale[1] gave practically the same description of a cell peculiar to ovarian fluid, but failed to give the tests by which to distinguish it from other granular cells.

Although we were formerly sceptical as to the exact validity of this cell of Drysdale as an absolutely conclusive evidence of an ovarian cyst, we are now disposed to look upon the matter in the following light: Our own experience leads us to say that whenever we have found Drysdale's corpuscle in the fluid from an abdominal cyst, it proved to be an ovarian cyst. On the other hand, in a few instances where we failed to find the corpuscle of Drysdale, the tumor still proved to be one of the ovary. We are therefore disposed to look upon Drysdale's corpuscle as an important and valuable auxiliary to the diagnosis of ovarian cysts, but by no means absolutely indispensable nor certain. We should certainly give the corpuscle, when found, the benefit of the doubt in any case of abdominal cyst, and pronounce the latter to be ovarian if the corpuscle were found in its contents.

In concluding a most comprehensive article "On the Diagnosis of Ovarian Cysts by Means of the Examination of the Contents," published in the *American Journal of Obstetrics*, vol. xv., 1882, Garrigues says that Drysdale's granular ovarian cell is no cell, but the nucleus of an epithelial cell in a state of fatty degeneration. Since Bennett's corpuscles, Drysdale's corpuscles, nuclei with dark granules, and cholesterin have no diagnostic value, the most important elements in regard to diagnosis are columnar epithelial cells seen in side view. Their presence excludes all other tumors than those of the ovary, Fallopian tube, and broad ligament (perhaps with the exception of a cyst of the pancreas). Waldeyer was the first who pointed out the presence and diagnostic value of the columnar cells. A fluid clear as water, and containing very few histological elements, and without nuclei, with shining granules (Drysdale's "ovarian cells"), may be found in ovarian cysts, both true monocysts (hydrops folliculi) and multilocular cysts with ciliated epithelium.

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[1] *The Microscope in its Application to Practical Medicine*, by Lionel S. Beale, M. D., F. R. S., etc., 3d ed., p. 179.

Causes.—Very little is positively known upon this subject. The predisposing causes which are generally admitted are the following:

Age;
Childbearing;
Chlorosis;
Scrofulous diathesis;
Menstrual disorders;
Depreciation from poor living.

It should be borne in mind that even as to some of these there are doubt and variance of opinion among gynecologists.

The affection commonly shows itself during the period of ovarian activity, and very generally during that of the most vigorous activity. It is rare under twenty and over fifty, the most common period of its occurrence being between twenty and forty. It may, however, occur in infancy, and as late as eighty. The newborn fœtus has even been found afflicted with an ovarian cyst, and several cases are on record in which children under four years of age have been successfully operated upon for this disease.

As regards the age at which ovarian tumors are most likely to occur, the statistics compiled by Olshausen[1] from figures given by Peaslee, Wells, Koeberlé, and Clay, in all 966 cases, show that there were—

Under 20 years	32
Between 20 and 30	266
" 30 and 40	298
" 40 and 50	213
Over 50	157

The largest number of cases is thus seen to occur in the third decade of the childbearing period; that is, at a time when ovarian activity is probably at its greatest height. With respect to the greater tendency of this disease to affect single or married women, tables furnished by Peaslee, Lee, Scanzoni, Wells, Nussbaum, and Olshausen show a proportion of 510 cases in single women to 730 married women, and would seem to indicate a greater disposition in favor of the unmarried condition. An examination of the years showing the greatest occurrence of the disease in single and married women respectively, taken from cases of Wells, Nussbaum, and Olshausen, gives the following result:

Under 20 years,	single, 23;	married women	0
Between 20 and 29,	" 151;	"	63
" 30 and 39,	" 82;	"	153
" 40 and 49,	" 80;	"	154
Over 50,	" 56;	"	135

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[1] *Diseases of the Ovaries*, 1877.

Although these last figures seem to show an increase in favor of the married woman after the thirtieth year, this deviation from the result of the previous table is easily explained by the fact that after that age many more women are married than single. The predisposition in favor of the single state still remains sufficiently prominent to merit attention.

It was formerly supposed that ovarian tumors were much more frequent among women of the poorer classes than among the wealthy, but we can find no statistics in support of this belief, and our own experience does not bear it out. The *predisposing causes* of cystic degeneration of the ovary mentioned above are indeed so uncertain that, with the sole exception perhaps of chlorosis accompanied by more or less complete amenorrhœa—that is, the imprŏper performance of the function of ovulation—none can be said to be distinctly chargeable on undisputed evidence with the production of this disease.

The uncertainty existing as to the exciting causes is even greater than this. All those influences which theoretically would be likely to excite cystic growth, as oöphoritis, blows, checking of menstruation, excess of coition, libidinous desires without gratification, have been advanced by authors as scientific certainties. But proof is wanting, however plausible the theoretical reasoning appears, and they cannot in the present state of science be admitted. In the great majority of cases these tumors develop in women who have led rational and quiet lives, in whom no prejudicial influence can be discovered as having existed, and who have detected the growth of the tumor when imagining themselves in very fair health.

Certainly nothing can with safety be assumed beyond this, that it is probable that those influences which keep up and intensify ovarian congestion, and interfere with rupture of the follicles of De Graaf, tend to produce cystic and follicular degeneration. Kiwisch, Rokitansky, and Rindfleisch all agree in thinking it probable that inflammation affecting the walls of the vesicles has an influence on the production of the disease.

Natural History of Ovarian Cysts.—Ovarian cystic tumors develop either by one or by a number of cysts. In the first case the cyst may become fully distended by fluid, reach a point where its growth ceases, and remain quiescent, only annoying the patient by the mechanical results of its presence and the apprehension that it may increase and create trouble. There are no grounds for doubting the evidence that such tumors may remain without increase for even forty or fifty years, but such cases are rare exceptions to a general rule.

We now and then meet with pulmonary tuberculosis which goes on to the formation of a large cavity, and then for some unaccountable reason ceases to advance. The cavity, which is distinctly discernible, remains quiescent, and the patient may live for years. As this is an exception to a rule in the natural history of phthisis, so is the tardy course of ovarian dropsy just alluded to an exception to the usual course of that affection. The oligocystic tumor grows much more slowly than the polycystic, and this is the more marked as it approaches the monocystic type. [I removed one which had been under my own observation for nine years, and only at the end of this time did its existence affect the constitution.—T. G. T.]

If its type be multilocular, the tumor advances more rapidly, certainly, and uncontrollably than in the case just mentioned. The prognosis of ovarian dropsy not interfered with by art—and by this we mean surgical art, as medicine has no controlling or curative power in the disease—is always unfavorable. The average duration of the cases of both types is supposed by the best modern authorities to be about three years of life after the inception of the affection.

Mr. Safford Lee has collected statistics[1] as to the duration of the disease in 123 cases not subjected to any curative surgical treatment:

In 38	the duration	was	1 year.
25	"	"	2 years.
17	"	"	3 "
10	"	"	4 "
4	"	"	5 "
5	"	"	6 "
4	"	"	7 "
3	"	"	8 "
17	"	"	9 to 50 "

From this it will be seen that out of 123 cases, 80 terminated within three, and 94 within five, years. At the same time that the fact must not be lost sight of that 17 out of 123 cases lasted over nine years, and that some, the number of which is not stated, terminated at the end of fifty, it must not be accepted as certain that these were cases of true ovarian cystoma.

[I have removed an undoubted mutilocular ovarian cyst which had lasted, the evidence in favor of duration being medical and perfectly reliable, for twenty-three years; another for twelve and a half years; another for ten; and another for nine years.—T. G. T.]

Spontaneous Cures of Ovarian Cysts.—Sometimes nature effects a cure in one of the following ways: The cyst may discharge into the peritoneum and absorption occur. Of this accident Dr. Tilt has collected 71 cases, of which 30 recovered, 19 were improved, and 21 died. We have met with four instances of such rupture, two of which proved fatal by peritonitis. The cyst-walls may undergo calcareous degeneration, which checks advance. The cyst may discharge externally by the abdominal or dorsal surfaces, or into the rectum, bladder, vagina, or uterus by means of the Fallopian tubes. Instances of the last occurrence are mentioned by Morgagni, Frank, Follin, and Boivin, and Richard records five cases.

With reference to nature's power alone, or aided by absorbents, to remove the accumulated fluid, it would scarcely seem fair to the eminent authorities mentioned above, who have reported cases where this occurred, to deny its possibility; but, in our opinion, the only ovarian cysts in which absorption of the contents which have escaped by rupture into the peritoneal cavity occurs, are those in which the fluid was thin, translucent, and free from granular matter, nucleated cells, and the other usual ingredients of ovarian polycysts. That gelatinous and colloid matter is not absorbed by the peritoneum has been proved to us by a number of instances in which we operated after rupture of an ovarian cyst had taken place some time before [in one case undoubtedly a year.—P. F. M.], and the abdominal cavity was found filled with the unchanged ovarian fluid.

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[1] We have found ourselves compelled to reproduce this old table, simply because we could not discover any more recent figures covering the same ground; which is probably due to the fact that of late years ovarian tumors have not been allowed to grow until they attained a certain size or killed the patient, but have been removed as soon as discovered.

Morbid Conditions to which Ovarian Cysts are Liable.—Inflammation and suppuration of ovarian cysts may follow tapping or aspiration (it is scarcely likely to follow the former nowadays, since the practice of tapping has been substantially abandoned), or it may result from accidental causes, such as a bruise or an injury to the abdomen, or it may occur in consequence of a twisting of the pedicle of the tumor. The occurrence of pain, elevation of temperature, and general indisposition will lead to a suspicion of the true facts, the causes being perhaps obscure or discoverable on a careful inquiry into the history of the case. As a rule, when these symptoms occur in a patient in whom the diagnosis of ovarian cyst has been made, their nature is no longer in doubt, and the only true indication for treatment is immediate removal of the tumor by laparotomy. This was considered until within recent years quite a feat in the domain of ovariotomy, Keith having been the first to take the risk of cutting through an inflamed peritoneum for the purpose of removing an ovarian cyst which caused this inflammation. His result was so successful, the patient recovering as by a miracle after the operation, that his example was soon followed, and nearly every ovariotomist of experience now has cases of the kind to record. In nearly all the early cases the inflammation and suppuration of the cyst occurred as the result of tapping; in the later, torsion of the pedicle has probably been the most common cause. It is safe to say that unless the general health of the patient has become too much debilitated, recovery from the operation under these circumstances is quite as probable as in uncomplicated cases. We have had the opportunity to operate on a number of such cases, and have saved some that seemed absolutely desperate.

Peritonitis and adhesions may follow inflammation and suppuration of the cyst just mentioned or other accidental causes, the adhesions, of course, being secondary to the peritonitis. Adhesions, indeed, are by no means necessarily a sign of a preceding acute inflammation of the abdominal peritoneum, since they are found very commonly—are, indeed, one of the great unknown quantities to be expected and provided for—in every ovariotomy. Simple contact between the surface of the ovarian tumor and the adjacent parietal and visceral peritoneum may by friction or serous agglutination result in more or less firm and extensive adhesions to the abdominal wall, intestines, and omentum. The diagnosis of these adhesions is by no means easy before opening the abdominal cavity. Their presence may be suspected by certain irregularities of growth and conformation of the tumor, by its greater proximity to one side of the abdominal cavity, by its failure to grow out of the pelvic cavity, and by its apparent attachment to one part of the abdominal wall; but nothing certain can be known until the hand is introduced into the abdominal cavity. The greater or lesser presence of adhesions between the cyst and the other pelvic and abdominal viscera has of course a very decided influence upon the ease or difficulty of the operation for the removal of the tumor, and consequently upon the chances of recovery. This applies particularly to adhesions between the intestines and the cyst, which in our opinion are the most unpleasant and difficult complications to be met with in ovariotomy.

Twisting of the pedicle means the rotation upon its own axis of the tumor one or more times, and may not be followed by any unpleasant consequences so long as the torsion is not sufficiently sharp to constrict the large vessels running to the tumor, and interfere with the nutrition of the latter. This accident is limited usually to the smaller tumors; that is, to such which, as they rise out of the pelvic cavity during their natural growth, can be turned upon their axis by the movements of the patient, or, as is most commonly the case, by the peristaltic action of the intestines. If a tumor has once reached so large a size that it fills the abdominal cavity and distends the abdominal walls, it is scarcely likely that it could be turned upon its axis sufficiently to twist its pedicle by its spontaneous motions, or indeed by any force applied either from within or without. The recognition of this occurrence is by no means a modern achievement, it having been described by Hardy in 1845,[1] Ribbentrop in 1846, Van Buren,[2] and carefully studied and analyzed by Rokitansky in the third edition of his textbook and in the *Wiener Allgemeine Med. Zeitung* in 1860. Its comparatively frequent occurrence and the dangers resulting from it are now fully recognized, although the exact manner in which the torsion takes place may be still a question to be answered only by an examination of each case. Usually only from a half to two twists are found in the pedicle, although we have seen from three to five, producing complete gangrene of the tumor (P. F. M.). In very rare cases, with an unusually thin pedicle, complete severance of the pedicle may take place in this manner, the separated cyst either becoming gangrenous and causing peritonitis by rupture or infection, or it may continue to live through adhesion to one of the neighboring organs, from which it thereafter draws its life. [I once produced a twisting of the pedicle of a multilocular cyst, the nature of which was doubtful, by manipulations made for the purpose of perfecting a diagnosis. The subsequent operation showed a recent peritonitis, produced unquestionably by the twisting of the pedicle. I have operated on nine cases of twisted pedicle, in one of which there was a double torsion of the pedicle, which was at least six inches long, the cyst being so rotten that I had to remove it from the abdominal cavity by passing my hand underneath and scooping it out. But all the patients, this one included, made uninterrupted recoveries.—P. F. M.] In such cases more or less fresh and extensive adhesions form an additional difficulty to the operation. The diagnosis of twisted pedicle is usually not made until the ovarian cyst has been lifted out of the

[1] *Lancet*, April, 1845.

[2] *New York Journal*, March, 1850.

abdominal cavity, although it may be suspected from the symptoms of inflammation and pain, which are unusual in ovarian cysts except as the result of some such complication. It is almost needless to say that the slightest suspicion of the occurrence of this accident calls for an immediate laparotomy.

Intracystic Hemorrhage.—The presence of more or less fresh blood in an ovarian cyst can usually be accounted for only by the rupture of a blood-vessel in the walls of the cyst. This may be due to an interference with the circulation, such as is produced by torsion of the pedicle, or it may be caused by ulceration of the walls of one of the larger vessels, usually a vein running in the cyst-wall, or it may be a symptom of the malignant nature of the tumor. The diagnosis of the accident can be made by a rapid increase in the size of the tumor, accompanied by corresponding symptoms of general anæmia, and confirmed by the removal with the aspirator of bloody fluid showing under the microscope a very large quantity of red blood-corpuscles. While a few blood-corpuscles do occur in ovarian cysts occasionally, the color of the fluid is not influenced by their presence; but whenever ovarian fluid has a blood-red color the probability is that this is due to a more or less recent intracystic hemorrhage. The occurrence is not one of special importance, except when the influence of the loss of blood upon the general system calls for speedy arrest of the hemorrhage by the removal of the bleeding cyst.

Rupture of the Cyst.—In former days the contents of an ovarian cyst were supposed to be poisonous, or at least highly dangerous, to the abdominal peritoneum; therefore the greatest care was exercised during ovariotomy to prevent any of the fluid escaping into the peritoneal cavity or remaining there, since it was assumed without question that it would always produce peritonitis, septicæmia, and death. This has been shown, however, not to be the case, since numerous instances are on record in which ovarian cysts have accidentally ruptured, sometimes almost unknown to their possessors, with no other evil consequences than a comparatively slight peritonitis, from which the patient recovered in due time. The amount of irritation produced upon the peritoneum by the cyst contents depends, of course, a great deal upon the nature of those contents: the thicker and less capable of absorption is the effused cyst-fluid, the more acute, more serious, and more lasting is the peritonitis which it excites; and undoubtedly in the majority of cases a chronic peritonitis is established which eventually results in the distension of the abdomen by additional ascitic fluid, the condition being then taken for ascites from some unknown cause. If, then, a patient falls into the hands of a laparotomist, her abdomen is opened, probably with the view of making the diagnosis, and to the surprise of the operator is found to be filled with the peculiar viscid or colloid material characteristic of ovarian cysts, and the ruptured cyst is easily detected and removed. The better the health of the patient at the time of this operation, the greater of course the chances for her recovery. We have operated on quite a number of cases of this kind, and have had some surprising results, even when the rupture had taken place, so far as we could ascertain, a number of months before. The thorough cleansing of the abdominal cavity by irrigation, and usually the employment of the drainage-tube, are important features in the operation.

A number of cases are on record in which ovarian cysts have allowed their contents to escape into the abdominal cavity through comparatively small openings at repeated intervals, each such occurrence being characterized by general abdominal pain, more or less distinct symptoms of peritonitis, and diminution in the size of the abdomen. The mystery in these cases—for even to the most experienced such an accident is not a frequent occurrence and not always easy of explanation—is cleared up when finally laparotomy is performed, and an ovarian cyst is removed in the wall of which is found an opening permitting the passage of a large knitting-needle or even a pencil, the cyst-walls being flaccid and the abdominal cavity containing ovarian fluid. Usually the abdominal peritoneum shows signs of a more or less recent inflammatory process. If the patient has borne the repeated emptying of the cyst contents into the peritoneal cavity fairly well, her chances of recovery from the removal of the cyst are no worse than after any ordinary ovariotomy.

Conditions likely to Complicate Ovarian Cysts.—

Pregnancy;
Fibroids of the uterus;
Cancer of the uterus;
Diseases of the kidney;
Diseases of the liver, heart, and lungs;
Compression of the ureters;
Elevation of the bladder.

Pregnancy as a complication of ovarian cysts is by no means a rare occurrence. That it may occur when only one ovary is diseased is self-apparent, but that it does take place when both ovaries have undergone cystic degeneration, even to the development of tumors of more or less pronounced size, seems rather strange. Still, some cases are on record in which this has taken place, one of the most remarkable being probably that witnessed by both of us (the patient being under Mundé's care and operated by him) in which both ovaries had undergone cystic and dermoid degeneration to such an extent that apparently nothing was left of the normal structure of the organs, and still pregnancy occurred and went on to the fifth month, being terminated by the irritation produced by the removal of the ovarian tumors. The occurrence of pregnancy during the existence of an ovarian cyst so far complicates the treatment and prognosis of the latter in that the larger the uterus grows in advancing pregnancy, the more will the uterus and the ovarian tumor together interfere with the comfort and general health of the patient. Both tumors together—one of which, the uterus, is at least growing steadily—will of course enlarge the abdomen very much more than either one separately. The pressure upon the kidneys, the liver, intestines, and secondarily the lungs and heart, would necessarily therefore be much greater, and the call for relief more urgent, than in either normal pregnancy or ordinary cystic disease. We do not mean to say that the ovarian tumor grows during pregnancy in proportion to the increase in size of the uterus; on the contrary, we think that the compression exerted upon the ovarian tumor by the constantly increasing pregnant uterus rather retards the growth of the former; still, the two together are very apt to affect the patient in such a manner as to require more or less speedy relief. This may be effected either by emptying the uterus—that is, inducing abortion or premature labor—or by removing the ovarian tumor by abdominal section. It is usually advisable to endeavor to save the child, if in any way possible, by allowing the pregnancy to go on until the fœtus is viable; that is, up to the end of the seventh month. If the condition of the patient permits, the tumor may be removed by laparotomy as soon as she has recovered from the puerperal state. Where, however, the ovarian tumor grows more rapidly than the pregnant uterus, or is situated between the latter and the pelvic outlet so as to interfere with the normal expulsion of the child at term, an early removal of the ovarian tumor is indicated, even at the expense of a possible interruption of the pregnancy. The operation of ovariotomy during pregnancy has been proved by numerous statistics to be very little more dangerous than when performed under usual circumstances. Olshausen in 1886 reports a total of 82 operations with 74 recoveries, the majority of those recovering carrying their children to term. The question as to whether the ovarian tumor should be removed and the pregnancy allowed to go to term, or the pregnancy be interrupted and the operation of the ovarian tumor be postponed to a later date, depends entirely upon the predominance of the pregnancy or the tumor in each given case.

Fibroids of the Uterus may complicate cystic disease of the ovary, but exert very little influence either upon the progress of the cyst or upon the treatment and prognosis.

Cancer of the Uterus, cervix or body, may occur at the same time with cystic degeneration of one or both ovaries. If the cancer were radically incurable, we do not think we would advise subjecting the patient to the danger, however slight, of an ovariotomy, since in all probability the cancerous affection would kill her before that of the ovary. Only when it seems possible to eradicate the cancerous disease, so as to give hopes of a perfect cure, would the removal of the ovarian tumor at the same or a later time seem justifiable. Of course, if we were removing a cancerous uterus *per vaginam*, and chance to discover the existence of an ovarian cyst of moderate dimensions at the same time, we should endeavor to do our duty toward the patient by removing both diseased organs at the same sitting.

Diseases of the Kidneys, Liver, Heart, and Lungs are not at all uncommon as complications of cystic degeneration of the ovaries. With the exception of disease of the kidneys, they are usually due to causes in no way dependent upon the enlargement of the ovaries; but the kidneys are very liable to become degenerated in consequence of the pressure produced on the ureters by the constantly increasing ovarian tumor, chiefly if the development of the latter is intraligamentous and extra-peritoneal; that is to say, between the layers of the broad ligament. The ureter may thus become obstructed on the affected side; distension of its canal above the point of obstruction and of the pelvis of the kidney may ensue, with inflammation and suppuration of both parts. Naturally, an inflammatory and suppurative degeneration of the kidney itself follows, which may attain a sufficient degree to cause death. That this complication is not more frequent in ovarian tumors is a matter of surprise, to be accounted for only by the tendency of the tumors to grow toward the abdominal wall and away from the vertebral column. The larger an ovarian tumor grows, the more of course will it interfere with the circulation in the abdominal viscera, particularly with the return of venous blood to the heart. Œdema of the lower extremities, with the occasional inflammation of the larger veins, is therefore not a very uncommon occurrence in large ovarian tumors.

The bladder is occasionally carried away from its normal position up into the abdominal cavity by becoming attached to the anterior surface of an ovarian tumor, or by being pushed up out of the pelvis through the development into the pelvic cavity of a cyst of the ovary. [I have recently seen such a case in which a dermoid tumor of the left ovary, the right being also diseased in the same manner, pushed up the bladder, so that it narrowly escaped injury on opening the peritoneal cavity. On removal of the tumor the bladder dropped back to its normal position.—P. F. M.] If this elevation of the bladder is unsuspected, it is easy to understand how it may be opened by a hasty incision through the abdominal wall.

Of course an inflammation of the peritoneum with adhesions between the cyst and the adjoining viscera, a pleurisy or pneumonia, a gastritis, a gastro-intestinal catarrh, may complicate the presence of an ovarian cyst, but they do not necessarily depend upon its existence, and, once recovered from, have no bearing upon the further development of the ovarian disease, with the exception of the peritonitis, which may have left adhesions more or less extensive, and therefore of considerable interest to the expectant operator. A rise of temperature complicating an ovarian cyst, unless distinctly referable to inflammation of that organ or to peritonitis, must be due to some cause which might occur at any time entirely irrespective of ovarian disease. The possibility of suppuration of the cyst, peritonitis, and septic infection should always be borne in mind in such cases as possibly indicating speedy operative interference.

Methods in which Death is Produced.—There are several modes in which ovarian dropsy produces its usual fatal result when uninterfered with by surgical means:

1st. A cyst may rupture and produce peritonitis, either before or after suppurative inflammation of its walls.

2d. Inflammation of the cyst-wall may result in the filling of the cyst with pus, which produces septic infection and in time exhaustion and death.

3d. Death of the cyst may occur from twisting or rupture of the pedicle and cause septicæmia.

4th. Prolonged interference with the functions of nutrition and respiration may sap the powers of life.

5th. Acute or chronic peritonitis may either cause rapid death or gradual exhaustion.

6th. Fatal hemorrhage may occur into the cyst.

7th. Finally, from the combined depreciating influences of this condition, gradual or sudden prostration of strength may close the scene by death.

Every one having charge of a case of ovarian tumor should recollect that often the only hope of saving life, threatened by the accidents here recorded, consist in an immediate resort to ovariotomy. Even acute peritonitis has been thus cut short, and patients with a temperature of 105° from suppuration of the sac have been saved.

We now approach the important subject of symptomatology of ovarian cysts, and their differentiation from other morbid conditions met with in the abdomen.

Differentiation.—The faculty of distinguishing between different forms of abdominal tumors in the female is one acquired only by long years of experience and after many failures. The distinctive points of many of these tumors are so obscure, and so dependent upon the sense of touch of each individual examiner, that no absolutely certain rules can be laid down for diagnosis and no infallible precautions be advised to prevent error. In each case the symptoms have to be carefully considered, reviewed, weighed against each other, and then by a gradual process of elimination the probable diagnosis must be narrowed down to as close limits as possible. The justification for these remarks will be found in the fact that pregnancy, uterine fibroids, distended bladder, cysts of other abdominal organs, adipose development of the abdominal walls, distension of the abdomen by gas, etc., have all been mistaken on repeated occasions, and often by really competent examiners, for ovarian tumors. We ourselves have more than once been at a loss to determine whether an abdominal tumor was one of the ovary, which was the most natural to suspect, or of the uterus, kidney, spleen, liver, or omentum; and mistakes of the most flagrant nature have been made by men standing high in the records of obstetrical and gynecological science. For this reason we desire to devote some special attention to the discussion of the differentiation between ovarian and other tumors in the abdomen which resemble or simulate them.

SOLID ABDOMINAL TUMORS RESEMBLING OVARIAN TUMORS.—*Pediculated Fibroids.*—It is usually a matter of the greatest difficulty to decide whether a tumor apparently attached to the uterus by a slender, long pedicle, said tumor being freely movable in the abdominal cavity, being very little if at all tender to the touch, having a semi-soft, elastic feel, and having grown but slowly, is a pediculated uterine fibroid or a fibroma of the ovary. We really know of no one sign or series of signs which would enable us to make a positive diagnosis in such a case. The uterus is not involved in either instance; its length remains normal; it is not moved when either the pediculated or the ovarian fibroid is pushed about; and apparently there is no connection between the tumor and the uterus. The only symptom which might help would be that an ovarian fibroid is likely to cause more pain with and without pressure than a pediculated fibroid of the uterus.

Solid Tumors of the Spleen may simulate solid tumors of the ovary, because the former frequently extend down into the abdominal, and even into the pelvic, cavity, so that they can be reached through the vaginal vault. The uterus and ovaries may be more or less masked to the examining finger by the presence of this abdominal growth, and therefore the ovaries cannot be detected. If this were possible, of course they would be at once eliminated from consideration. The peculiar sharp upper border of the spleen, the absence of that organ from its normal position, the history of malaria or leucocythæmic disease, would of course help to turn the scale in favor of splenic disease, but the diagnosis may often be exceedingly puzzling. Thus we both saw a case a year ago (the patient being under Dr. Mundé's care, who asked Dr. Thomas to see her with him) where we agreed that the tumor had the outward appearance and feel of an enlarged spleen (normal splenic dulness being indistinct), but that an exploratory laparotomy was indicated. This was done, and the tumor found to be a multilocular ovarian cyst, which was removed and the patient recovered.

Displaced Kidney.—It would hardly seem possible that a displaced kidney should be mistaken for an ovarian tumor, but still this has been done in one case by Mundé, who found what he considered to be an adherent small ovarian tumor in Douglas's pouch, and on removing it by laparotomy discovered it to be the displaced left kidney. Fortunately, the patient recovered. In another case recently seen by a physician of this city the tumor was found above the umbilicus on the left side, was freely movable, was about the size of a cocoanut, and extremely tender; it was pronounced to be the displaced and enlarged left kidney. When Mundé saw the case several weeks later the tumor had dropped below the umbilicus, and was pronounced by him to be an ovarian cyst, which diagnosis he verified by laparotomy.

Tumors of the Anterior Abdominal Wall (Desmoids) are usually of a fibrous or sarcomatous nature. They should in reality never be mistaken for intra-abdominal growths, but they are often so closely attached to the abdominal peritoneum that it is almost impossible to say, until they have been cut down upon, whether they are extra- or intra-peritoneal. Of course this difficulty of diagnosis is enhanced by the presence of a large amount of adipose tissue.

ABDOMINAL AND PELVIC CYSTS RESEMBLING OVARIAN CYSTS.—*Cysts of the Broad Ligaments* may at times so closely resemble ovarian cysts that the differential diagnosis is absolutely impossible except by the examination of the cyst contents. The fluid in cysts of the broad ligament is always limpid, clear, and transparent as spring-water, containing no microscopical elements whatever except a few columnar epithelia. Very rarely such limpid fluid is found in ovarian monocysts, but then usually the granular corpuscle of Drysdale settles the diagnosis. Like the ovarian cysts which develop between the layers of the broad ligament, the cysts of the broad ligament probably spring from the organ of Rosenmüller, the so-called parovarium, develop downward into the pelvic cavity between the layers of the broad ligament, and usually only when they have reached the bottom of the pelvic cavity extend downward into the abdominal cavity, dissecting up before them the parietal layer of the peritoneum. They are therefore always extraperitoneal, no matter how much they may project into the abdominal cavity or cause the anterior abdominal wall to protrude. The chief point of diagnosis is the ease with which the cyst is felt *per vaginam*, the depth to which it reaches in the pelvic cavity, often extending as low as, or even lower than, the level of the external os, the immobility of the cyst, the absence of the usual ovarian cachexia, the slow growth of the cyst, and its comparatively slight dimensions. These cysts indeed seldom grow larger than an adult head; still, cases are on record in which they attained the size of the pregnant uterus at term, and Mundé has operated on one which contained thirty-eight pints of fluid. The older operators favored the mere puncture of these cysts, either *per vaginam* or through the abdominal walls, evacuation of the contents, and trusted in the efforts of nature to effect contraction of the cysts. It was thought that in this way these cysts could be cured by simple evacuation of the contents, but later experiences have taught that even cysts of the broad ligament are liable to refill, and that the only permanent cure for them is to remove them in the same manner as is done with intra-ligamentous ovarian cysts; that is, cysts of the ovary which grow down between the layers of the broad ligament, instead of developing, as ovarian cysts usually do, toward the abdominal cavity. This can be done either by enucleating the whole sac from its socket and sewing the edges of the wound in the broad ligament to the abdominal incision, or else by sewing sac and broad ligament to the abdominal incision without enucleation of the cyst. The pocket thus left behind gradually shrinks and heals by granulation.

Uterine Fibro-Cysts.—There is probably no more difficult diagnosis to make in the region of abdominal tumors than that between a fibrocyst of the uterus and a multilocular ovarian tumor. The history as to length of growth, original position of the tumor, amount of pain, etc. is usually very indefinite. If anything, the fibro-cyst has taken longer time to grow than the ovarian cyst; then an important sign has always seemed to us to be that of the comparative absence of constitutional derangement in uterine fibro-cysts, whereas in ovarian polycysts of the same size it was very marked. We would decidedly advise that particular attention be paid to this symptom, the neglect of which has in two instances resulted in our (P. F. M.) operating on a uterine fibrocyst which we would certainly have let alone if we had made the correct diagnosis. The examination of the fluid removed by aspiration is of very little diagnostic value. The length of the uterine cavity likewise does not always afford much assistance, since in many fibro-cysts the body of the organ itself is in no way involved. The most experienced and careful examiners and operators have made mistakes in this particular quarter.

Encysted Peritoneal Dropsy.—As a result of general peritonitis, localized accumulations of fluid are occasionally found, which simulate an actual cyst in consequence of agglutination of the intestines around the effusion. If these are situated near the brim of the pelvis, they may very readily simulate an ovarian cyst. Examination of the fluid removed by aspiration, which will reveal the presence of pus-corpuscles perhaps, or possibly the absence of any organic elements except flat epithelial cells from the peritoneum, and the history, will usually protect the examiner against an erroneous diagnosis.

Renal, Hepatic, and Splenic Cysts.—As a general rule, all cysts or tumors which grow from above the umbilicus downward toward the pelvic brim push the intestines before them, and there will usually be a zone of resonant percussion sound between the symphysis pubis and the lower border of the tumor. This is exactly the opposite from what occurs in ovarian tumors, which, growing from below upward, push the intestines before them in the direction of the diaphragm. Only when a coil of intestine becomes accidentally adherent to the anterior surface of an ovarian cyst will resonant percussion sound ever be found between the symphysis pubis and the upper border of the cyst. Besides, it must be remembered that cysts of the spleen and liver originate and spread downward from the left and right hypochondria respectively—that the absence of these organs in their normal position is essential to the possibility of the abdominal tumor being of that character. Moreover, the peculiar shape of the spleen and liver will aid in the diagnosis.

Renal cysts very rarely extend as far down as the pelvic cavity (although we must not forget that a displaced kidney may be found even at the bottom of that cavity; see Mundé's case), and Polk removed a kidney situated at about the level of the pelvic brim which he mistook for a small ovarian tumor.

Examination of the urine will usually be of little service in determining the presence of renal cysts. The examination of the contents of the cyst, however, removed by aspiration, will probably result in a correct diagnosis, since probably urea and renal epithelia will be found. In a case of supposed ovarian cyst which Mundé saw some twelve years ago, but in which the correctness of the diagnosis was questioned in consequence of the exceedingly slow growth of the apparently monocystic tumor and of its attachment to the right hypochondrium, examination of the aspirated fluid showed bile and distinct liver-cells, at once proclaiming the cyst to be one of the liver. Mundé referred the case to Dr. Thomas at his clinic, who confirmed the diagnosis, and also concurred in Mundé's decision not to operate. This decision was differed from by her physician in the country, and the patient promptly died after the operation.

Parasitic Cysts.—These are usually the result of the entrance into the system of the *Cysticercus cellulosæ*, both the parent and offspring of the *Tænia solium*. They develop either in the liver, spleen, pelvic cellular tissues, or very rarely in the substance of the uterus itself. They may attain great size and grow very rapidly. Their diagnosis is usually entirely obscure until some of the aspirated fluid has been placed under the microscope, when the peculiar scolices of the parasite at once reveal the diagnosis.

Hydro-salpinx.—A differentiation between an accumulation of serum in the Fallopian tube and an ovarian cyst will become necessary only in the case of small monocystic tumors of the ovary. Hydro-salpinx very seldom attains dimensions larger than that of a pint measure. It usually remains loose, or perhaps attached in the bottom of Douglas's pouch. It is unilocular, fluctuating, not particularly tender, and the history is more or less obscure. Aspiration *per vaginam* will usually make the diagnosis, since the fluid from hydro-salpinx will present absolutely negative results under the microscope, whereas in the ovarian cyst usually, but not always, the granular corpuscle will be found. Besides, in hydro-salpinx columnar epithelium may possibly settle the diagnosis in favor of the tubal affection.

Cysts of the Omentum, Mesocolon, and Pancreas.—These formations are of such rare occurrence that but very few instances are on record, and no positive diagnostic points can be given for them except by means of examination of the fluid removed by aspiration. Mundé saw a cyst of the mesocolon which he considered to be an ovarian cyst, since bimanually he thought he could clearly trace its attachment to the left broad ligament. The same view was entertained by Drs. T. A. Emmet and Robert Watts, the latter of whom finally secured the case for operation, and discovered the error of diagnosis too late to save the patient, who died from the operation.

Tubercular Peritonitis.—This disease is usually not discovered until the opening of the abdominal cavity made for the purpose of arriving at a diagnosis or for the removal of a supposed ovarian cyst or tubal disease shows the intestines and abdominal peritoneum studded over with yellow dots, which at once make clear the character of the disease. The indication for the operation will usually have been the detection of a more or less defined abdominal tumor, commonly felt on one side or the other in the ovarian region, and supposed therefore to be an ovarian or tubal cyst. In reality, it is an agglutination of the intestines, with the encapsulation of a certain amount of fluid, in this respect resembling encysted dropsy, already referred to. Of course, tubercular disease of the tube and ovary may be the original site of the disease, the germs having probably entered through the vagino-uterine canal. Exactly how to differentiate between localized agglutination of intestines and encapsulated fluid in tubercular peritonitis and small ovarian cysts we are at a loss to determine. We would merely beg our readers to bear in mind the comparative frequency of this disease, especially in the female sex, and the possibility that an obscure case of abdominal or suprapelvic cyst may be of this nature. The combination of tubercular disease of other organs must by no means be accepted as a guide for diagnosis in such cases, since usually the tubercular disease of the peritoneal cavity comes on by itself insidiously, and may even turn out fatally without involving any other organ of the body.

Cysts connected with the Spinal Cord.—A very few instances are on record in which a congenital separation of the lower portion of the spinal cord, a hydrorhachis, has allowed an amount of fluid to gradually push before it the spinal meninges and encroach upon the pelvic cavity. Usually the direction of this cystic distension is backward toward the skin, forming the well-known and not uncommon condition called spina bifida; but if this should grow toward the pelvic cavity, it is evident such a cyst might simulate a deep-seated ovarian or broad-ligament cyst, and that the diagnosis might be attended with some difficulty. The discovery of the cleft in the spinal column will of course clear up the case at once. Emmet described a most typical instance of this deformity which entered his service in the Woman's Hospital in 1870 (see *American Journal of Obstetrics*, February, 1871). The diagnosis was only made at the autopsy.

Ascites.—Strange as it may seem, a free effusion of serous fluid into the abdominal cavity has been mistaken for an ovarian cyst in more than one instance. Only a rather careless examination or a preconceived diagnosis can account for such a mistake; and still Mundé saw Scanzoni and Linhardt, both professors at the University at Würzburg, open an abdominal cavity for what they supposed to be an ovarian cyst, that being the diagnosis with which the patient had been sent to them (this was in 1868), only to find, to their great surprise and mortification, that it was a simple case of ascites due to chronic peritonitis. The patient fortunately recovered. The greater flatness of the abdomen, the change of position of the fluid as the patient turns from side to side, together with corresponding change of the resonant percussion sound, the uniform transmission of the wave of fluctuation from side to side, the entire absence of any encysted mass or of a circumscribed tumor in the abdominal cavity, and the discovery of a probable cause for the abdominal dropsy, will usually enable the physician to avoid making this, generally inexcusable, mistake.

Distended Urinary Bladder.—To mistake the distended bladder for an ovarian cyst is even a far greater blunder than applies to ascites, and still it has been done. This mistake can be made only by accepting the statements of the nurses or patients that the bladder has been regularly emptied, when the dribbling from that viscus was merely the overflow from the excessively distended organ. The introduction of a catheter will of course at once reveal the presence of an enormous quantity of urine, on the removal of which the supposed tumor is found to have disappeared.

Pregnancy.—It is not necessary for us to enter into any details as to the differential diagnosis between ovarian tumors and pregnancy. That such a mistake has been made can unfortunately not be denied, for the pregnant uterus has even been opened by operators supposed to be fairly intelligent, under the impression that they had to deal with an ovarian tumor. The only cases in which we can imagine the possibility of such an error are those in which enormous thickness of the abdominal walls prevented the fœtal heart from being heard and the fœtal parts from being felt on palpation, and in which the history was of so doubtful and misleading a character that the existence of pregnancy was not even suspected. That this may occur cannot be denied by any practitioner who has had an opportunity to see many cases of doubtful abdominal enlargement. A combination of pregnancy and ovarian cyst will naturally render the diagnosis still more obscure.

Pseudo-Cysts.—Under this heading we include several conditions which simulate abdominal cysts, but which in reality are no cysts or tumors at all. Foremost among these is the distension of the abdominal cavity by gas in the intestines. This symptom is usually not constant, and its true character can generally be suspected if the patient admits that the size of her abdomen is not always uniform, sometimes being larger and at other times smaller. Pendulous abdomen and an excessive development of adipose tissue in the abdominal wall may likewise simulate an ovarian tumor. We have seen numerous cases sent to us by their physicians with the diagnosis of abdominal tumor, which on putting the patients on their back, removing the clothes, and thus relaxing abdominal pressure, proved to be nothing more than the trifling anomalies just mentioned. The uniform area of resonant percussion sound in distension by gas, the possibility of flattening down of the abdomen in the dorsal position, and the possibility of lifting up five or six inches of fat from the abdominal muscles will usually settle the diagnosis.

Fecal Tumor (*Coprostasis*).—Strange as it may seem, an accumulation of fecal matter in the intestine has been more than once mistaken for an ovarian tumor. Such accumulations are usually not very large, perhaps varying from the size of the fist to that of a cocoanut, and their appearance and feel are often exceedingly deceptive, especially when incorrect and misleading statements are made by the patient or her physician as to the condition of the bowels, which are pronounced to be perfectly regular. We have seen small fecal accumulations which were clearly defined in outline, perfectly movable, not particularly tender, and situated on one or both sides of the lower part of the abdominal cavity, pronounced to be small ovarian tumors or pediculated fibroids of the uterus; and Mundé remembers one case which occurred in the Julius Hospital in Würzburg, in the service of the late Prof. Bamberger, the great authority on internal medicine, since deceased as professor at Vienna, where a woman was presented to the class with a large semi-solid ovarian tumor. Nobody doubted the diagnosis, but at the autopsy the tumor was found to be an enormous accumulation of pultaceous fecal matter which filled nearly the whole abdominal cavity. Through the centre of this mass ran a channel which accounted for the regular fluid evacuations, and explained why the attending physicians had never thought of fecal impaction. The importance of carefully eliminating the possibility of this occurrence—indeed, of assuring one's self against the possibility of a mistake by seeing that laxatives are administered before a conclusive examination is made—should be borne in mind in deciding on the diagnosis of doubtful cases.

Symptoms.—During the earlier periods of the development of ovarian cysts very few symptoms ordinarily show themselves. As enlargement goes on, the patient becomes struck by the fact that her abdomen has increased in size, and if both ovaries be affected menstruation sometimes ceases, and she may imagine she has become pregnant. Pressure of the small but increasing tumor will sometimes create dragging sensations about the pelvis, irritability of the bladder, and, if the growth occupy the retro-uterine space, as it often does, pain in the back. This is, however, by no means all the inconvenience which may be experienced. A small, movable cyst, which may be pushed about in the abdomen, will sometimes cause severe pain. [In one such case which I saw with Dr. Noeggerath, the account of which is published in Dr. Atlee's work on the *Ovaries*, ovariotomy was necessitated, when the cyst was no larger than a cocoanut, by excessive pain.—T. G. T.] [I recently met with a similar case, the cyst being unilocular, non-adherent, with a long pedicle. The pressure produced on the abdominal viscera by the very movable cyst seemed to be the only explanation of the pain, which ceased after the operation.—P. F. M.]

As the tumor grows and fills the abdomen, rising above the navel, a sense of distension is complained of, dyspnœa begins to show itself upon exertion, the patient feels more feeble than usual, and slight emaciation is observed. As it increases and begins to press upon the large viscera beneath the diaphragm, these symptoms increase, and the patient's face wears a peculiar expression, which has been styled by Spencer Wells the "facies ovariana.") This is created by an absorption of adipose tissue, an exaggeration of the natural furrows of the face, and an expression of anxiety and apprehension. To one who has studied this expression an imperfect description such as this will recall it; but to one who has not become clinically familiar with it it is impossible to convey a clear conception of it. To these symptoms the mammary and gastric symptoms of pregnancy sometimes, though rarely, add themselves.

Pressure upon the kidneys creates congestion of these organs, and scanty secretion is a common result. Occasional attacks of localized peritonitis are by no means rare, and hence in many cases ascites becomes a complication of the affection.

As the decadence of strength, the emaciation, and the impoverishment of the blood incident to this grave disorder increase with time, digestive and intestinal disorders show themselves, œdema of the feet and legs occurs, great feebleness appears, and the patient dies from progressive exhaustion.

A summary of the rational signs which may arise in consequence of ovarian cysts from the commencement of their growth to full development may thus be given: Irritability of the bladder, dysmenorrhœa, constipation, hemorrhoids, pelvic pains of neuralgic character, symptoms of pregnancy, scanty urinary secretion, intestinal and digestive disorder, deranged respiratory function, peculiar facies, emaciation, œdema, venous distension on surface, ascites, vomiting, diarrhœa, cardiac irregularity, aphthous stomatitis, and hectic. In cases advanced in the last stage all the last of these may show themselves, and in early cases all the first mentioned; but in many instances some of the most prominent of these signs are entirely wanting.

Physical Signs.—The symptoms thus far enumerated are never sufficient for diagnosis. They are usually only sufficient to suggest physical examination, by which reliable signs will probably be discovered and the diagnosis be made complete.

The physical signs of ovarian cysts are, therefore, of the greatest importance, and the full capacity of physical exploration should in every case be developed, for to it we must look for answers to the following questions:

1st. Does a tumor exist?
2d. If so, is it ovarian?

Does a Tumor Exist?—To decide this question the patient should be placed upon her back upon a flat, resisting surface, the abdomen uncovered, all constriction removed from the waist, and the knees drawn up so as to relax the abdominal muscles. It is of primary importance that she should be calm and give herself up to the examination in the full desire of aiding the physician in arriving at a diagnosis. In some cases the patient from nervousness, in some from pain created by pressure, and in others from a desire to mislead and deceive, will not be able or willing to do this, but by suddenly contracting the abdominal walls will place a serious, perhaps insurmountable, obstacle in his way. Under such circumstances ether should be employed as an anæsthetic and full investigation made. The abdominal muscles being entirely relaxed, careful palpation and deep, steady, and prolonged pressure should be made by both hands over the whole abdomen downward toward the spine, and especially over the pelvic region. By this means a more or less resisting mass may be discovered, which produces an abdominal enlargement visible upon inspection.

Thus far, very little has been learned; merely that an abnormal enlargement exists in the abdomen. It may not deserve the significant name of tumor, but be due to one of these states:

1st. Abnormal thickness of abdominal walls;
2d. Tonic spasm of abdominal muscles;
3d. Intestinal distension;
4th. Distension of urinary bladder;
5th. Pregnancy.

With care and caution each of these conditions may usually be eliminated by means which we shall soon consider. A neglect of such means has often resulted in great and needless alarm to patients, and a painfully humiliating and often ludicrous exposure of the practitioner.

It having been now decided that the patient has an abdominal tumor—or, in other words, an abdominal swelling due to a morbific cause of serious nature—it next becomes important to decide whether it be ovarian or not.

Is the Tumor Ovarian?—It has been already stated that any abdominal tumor may, unless careful means of differentiation are adopted, be confounded with ovarian growths. The truth of this will be appreciated by reference to the valuable tables of Dr. John Clay, the translator of Kiwisch on the *Ovaries*. He has collected 23 cases of attempted ovariotomy in which the operation was abandoned because the tumor proved not to be ovarian.[1] The tumors were of the following characters:

12 were uterine;
2 " omental;
2 " results of chronic peritonitis;
2 " not discoverable;

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[1] We have retained this table partly as a curiosity, and partly as a warning to the operators of the present day not to forget the possibility of an error in the diagnosis of abdominal and pelvic tumors. There is no ovariotomist living who will not be compelled to admit that he has made at least one mistaken diagnosis in such a case.

1 was tubal pregnancy;
1 " obesity;
1 " mesenteric;
1 " splenic;
1 " not stated.

So great did the difficulties of diagnosis for a long time prove that they were urged by the opponents of the operation as a valid objection to it as a surgical procedure. This, of course, is absurd. At the same time that these difficulties are still acknowledged, and that it is admitted that the most cautious and skilful diagnostician may be defeated by them, it can be confidently asserted that every year's experience greatly diminishes them, and that with the improved means now at command an experienced examiner will rarely be misled. Let us, however, again insist upon the fact that immunity from oft-repeated errors can be obtained, even by such an one, only by strict adherence to a conscientious and exhaustive examination of every case, a resort to all the known means of diagnosis, and a methodical exclusion of all conditions calculated to mislead.

It is a fact which we daily see demonstrated that an inexperienced diagnostician usually arrives at a conclusion by the application of a much smaller number of tests than a veteran examiner would dare to do. The latter has been so often deceived that he knows his weakness; the former has yet to learn.

The means of physical exploration which are at our disposal are the following:

Inspection and manipulation;
Mensuration;
Palpation;
Percussion;
Auscultation;
Vaginal touch;
Rectal touch;
The uterine sound;
Aspiration or paracentesis:
Chemical and microscopical examination of fluids of the tumor;
Explorative incision.

Solid ovarian tumors are rare, and seldom assume very large proportions, and, although ovariotomy is sometimes demanded for their removal, the operation is specially adapted to cystic tumors. We therefore pass to the more careful consideration of the diagnosis of these, and their differentiation from other abdominal enlargements.

An ovarian cyst usually develops markedly on one side of the abdomen, and if multilocular the abdominal distension is not symmetrical even in advanced periods. As it increases the cyst pushes the intestines aside into the hypochondriac regions. The ascending and transverse colon alone approximate their normal positions, and the omentum majus is usually pushed up over the front of the tumor. While the cyst is in the pelvis the uterus usually lies in front of it, but as increase of growth occurs it is ordinarily pushed behind it. There are, however, exceptions to both these statements. In rare cases, fortunately for the ovariotomist, a portion of intestine runs across the surface of the tumor, being fixed there by adhesion. The uterus, even late in the development of a large cyst, may be found in front of it, or lateroflexed, latero-verted, or even drawn completely above the pelvic brim. Curious as it may appear, great diversity of statement exists concerning the relation of cyst and uterus among writers on this subject. "Simpson's remark," says Peaslee,[1] "that 'if the sound show a tumor in front of the uterus the disease is certainly not ovarian,' is incorrect. The uterus is in front of an ovarian tumor only in exceptional cases, but is often so in cases of uterine fibroma and fibro-cyst." An ovarian cyst which has developed between the layers of the broad ligament usually grows downward, and is at first most prominently felt to one side of and behind the cervix, pushing down the vaginal vault. The uterus is always in front. This deep position in the pelvic cavity and immobility of a fluctuating cyst always point to an intraligamentous effusion, be it ovarian cyst, broad-ligament cyst, blood and serum (from ruptured tube perhaps), or pus. Our observation certainly agrees with that of Dr. Atlee,[2] that "the uterus may be dragged up or tilted up out of the pelvic cavity by the tumor, or, through these influences, it may be found on either side or displaced forward or backward within the pelvis. It may also be crowded downward against the perineum, or entirely extruded through the vulvar orifice. So that there is no general rule as regards the position of the uterus in ovarian tumors."

When the tumor has ascended above the umbilicus, as the patient lies upon the back the abdomen will appear rotund, a decided protuberance existing, and very little flattening out by sagging of fluid to the flanks occurring. As the hands are laid upon the surface and manipulation is practised, a firm, dense mass will be felt, which yields fluctuation, not usually of a superficial character like ascites, but less superficial and perceptible. Percussion will yield dulness all over the surface of the tumor and in one flank, but in the other resonance will generally exist. The surface of the tumor will often feel irregular and lobulated, and in multilocular tumors be more voluminous on one side than the other. If pressure be made upon the tumor as the patient lies upon the back, it will resist like a full sac, and not yield, and the pulsations of the aorta may be felt obscurely through it. By vaginal and rectal touch the lower surface of the tumor may be felt and obscure fluctuation elicited.

Mensuration practised from the umbilicus to the sternum, and the umbilicus to the anterior superior spinous processes of the ileum, will generally show a marked difference between the two sides in polycysts, and less difference in monocysts. In ascites the two sides are symmetrical. Auscultation serves to exclude pregnancy. By vaginal touch the position of the uterus as well as its mobility is ascertained, and when combined with conjoined manipulation the solid or cystic character of a small or even a large tumor may be determined by it. Should the tumor be found low in the pelvis in the later periods of growth, it is probable that a short pedicle exists, and also probably

[1] *Op. cit.*, p. 115.

[2] *Op. cit.*, p. 46.

adhesions. Should it have risen out of the pelvis, the pedicle is probably, but by no means certainly, a long one.

The uterine sound informs us as to the capacity, the mobility, and the sensitiveness of the uterus, as well as, to a limited degree, its relations to the tumor.

A rectal examination with one or two fingers may aid in the diagnosis of ovarian tumors, but is usually necessary only in intraligamentous cysts.

Emptying the cysts of the tumor of fluid by aspiration is likewise a most useful means of gaining information, and of great moment is the careful and intelligent examination of the fluids removed.

Lastly, we reach the crucial test of explorative incision, the value of which cannot be exaggerated, and which is attended by little danger. In fact, whenever there is the least doubt as to the diagnosis the abdominal incision should at first be made small—say not longer than two inches—so as to admit the two first fingers of the left hand; it can then always be enlarged if found necessary, or closed if removal of the tumor proves impracticable.

These are the means by which the positive signs of ovarian cystoma may be elicited, but before a diagnosis is arrived at by deductions based upon them many other abdominal enlargements must be carefully considered and excluded. If this be necessary merely in arriving at a correct diagnosis where no operation is to be practised, how much more so is it in view of the grave procedure of ovariotomy! Any one of the following conditions may mislead the investigator, and each of them must be in turn considered by him who desires to do his full duty to his patient and himself:

Abnormal thickness or tension of abdominal walls.	Obesity; Œdema; Tonic spasm.
Distension of abdominal viscera.	Tympanites; Fecal tumor; Dilatation of stomach;[1] Distended bladder; Hematometra; Physometra; Hydatiform mole; Hydro-salpinx.
Fluid accumulation within the peritoneum.	Ascites; Encysted dropsy; Hematocele.
Cystic disease of other parts in the abdomen.	Cyst of broad ligament; Renal cyst; Splenic cyst; Hepatic cyst; Parasitic cyst; Omental and pancreatic cyst; Uterine cysto-fibroma.

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[1] A most remarkable and interesting instance of this is recorded by Dr. Reeves Jackson of Chicago.

Excessive development or displacement of other viscera of the abdomen.	Uterine fibroma;	
	Enlarged spleen;	
	Enlarged liver;	
	Sarcoma of abdominal glands;	
	Malignant disease;	
	Omental tumor;	
	Displaced kidney;	
	Displaced liver.	
Pregnancy.	Normal;	
	Extra-uterine	Ventral; Tubal; Interstitial;
	With amniotic dropsy;	
	With ovarian cyst;	
	With dead child.	

Abnormal Thickness or Tension of Abdominal Walls.—Obesity will be recognized by obscure resonance on percussion over the whole abdomen; by absence of a defined, resisting outline to the supposed tumor; by the possibility of catching the fatty walls between the two hands, lifting them, and rolling them over the muscular floor beneath; by the deep depression which can be made when the patient is anæsthetized; and by the pendulous folds created by assumption of the sitting posture. It would be inexcusable in an expert to mistake this condition for ovarian tumor, but for an inexperienced examiner not at all so. We see numerous cases every year in which such an error is committed by very competent practitioners.

Œdema will be known by pitting upon pressure; by the existence of the same condition in the areolar tissue of the feet or face; and by its generally attending uræmia, chlorosis, or cardiac disease.

Tonic spasm of the abdominal muscles has more than once led, as has indeed obesity, to abdominal section for removal of a tumor. It often occurs under the name of "phantom tumor" in very hysterical women, and is not rare as a reflex result of caries of the vertebræ. It may be diagnosticated by resonance on percussion, absence of fluctuation, and absence of all signs of tumor under anæsthesia. In case of doubt anæsthesia should always be resorted to. In addition to these signs the unaltered position of the uterus constitutes an important one.

Distension of Abdominal Viscera.—Even without abdominal spasm a large amount of air sometimes accumulates in the intestines from hysteria, digestive disorder, or great obstruction in the canal. It may be known by resonance on percussion, absence of fluctuation, absence of all signs of tumor upon examination under anæsthesia, and the normal position of the uterus. By firm, steady pressure downward toward the spine, kept up and increased after each expiration, resistance will be overcome, and deep exploration prove the absence of a tumor.

Fecal tumor will be marked by absence of fluctuation; a peculiar "doughy" sensation upon manipulation; pain upon pressure; constipation; violent colic; and, most valuable sign of all, the creation of a distinct pit or depression when steady pressure is made at one point, the patient being anæsthetized. The action of cathartics and enemata is often entirely delusive as a test of fecal tumor.

The possibility of mistaking a distended bladder, accumulations of blood, fluid, and air in the uterus, and of fluid in the Fallopian tube, for an ovarian cyst, has already been pointed out under "Differentiation." The same applies to encysted peritoneal effusions and general ascites. We will therefore refer the reader to that section.

Fibro-cystic tumors are difficult of differentiation from ovarian cystomata, but when we compare our present position with reference to this subject with what it was only a few years ago, we have great cause for congratulation. We here give only the most prominent differences between the two diseases, and hence those upon which reliance can really be placed. To many of these even, however, there are exceptions; to several there are none:

Uterine Fibro-cyst—	Ovarian Cyst—
Grows slowly, and occurs usually after thirty years of age.	Grows more rapidly and is less governed by age.
Uterine cavity generally enlarged.	Uterine cavity not usually enlarged.
Connection of tumor and uterus usually, though not always, intimate.	Uterus more independent of tumor.
Fluid spontaneously and quickly coagulates.	Never does so.
Uterus sometimes lifted above pubes and out of pelvis, often in front of tumor.	Uterus generally behind tumor.
Health remains good for years.	Generally fails within three years.
Microscope shows fibre-cell (Drysdale).	Shows the peculiar granular and epithelial cells of ovarian cyst.

Although these signs are all of some value, those which should be regarded as most reliable are the following: spontaneous coagulability of contained fluid; presence of the fibre-cells; increased capacity of the uterus; and the determination of its connection with the tumor by means of rectal exploration. Explorative incision should not rank high as a diagnostic method, for simple section of the abdominal walls is not enough, and the exploration which is further required to decide the point exposes the patient to great danger.[1]

Diseased State of Pelvic Walls and Areolar Tissue.—Enchondroma or encephaloid disease of the pelvic walls is hard, free from fluctuation, and firmly fixed and united to the part from which it grows. Rectal exploration and abdominal palpation will prove these facts, and if aspiration be attempted the absence of fluid will be evidenced.

Pelvic abscess usually results from cellulitis, which presents marked symptoms. It rarely extends to the umbilicus, hardness will be felt in one or other iliac fossa, it is fixed in the pelvis, and aspiration gives evidence of pus. Excessive pain attends it, with throbbing and pain down one thigh, and the outline of the mass is obscure and unsatisfactory. There is often a tendency to point, there is pain upon pressure, and there are generally chills and fever.

Adhesions.—In the early days of ovariotomy, when adhesions were regarded as a bar to extirpation of these tumors, the question of the existence of adhesions possessed important bearings. Now, however, when even the firmest attachments are broken or tied and divided with impunity, it sinks into comparative insignificance. This is a most fortunate fact, for the reason that the determination of the existence of adhesions is little more than guesswork. Beyond a few very general facts, by which we may venture to form a surmise, all is empirical prediction with reference to the matter.

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[1] We retain this table of signs because we desire to emphasize the difficulty of diagnosing a uterine fibro-cyst.

If the case have developed very rapidly and be believed to be unilocular, there are probably no adhesions.

If there have been symptoms of peritonitis, there are probably adhesions. If the case have been painless, there are probably none.

Should the abdominal walls roll freely over the tumor, the patient lying upon her back, and should the tumor fall low in the abdomen as she suddenly sits up, there are probably no anterior adhesions. But omental, intestinal, and posterior ones may exist, and not be suspected from this examination.

If upon vaginal examination the uterus and base of the tumor exhibit immobility, such as is found in pelvic peritonitis, and if, upon change of posture from erect to supine, these parts do not retreat from the finger in the vagina, there are in all probability strong pelvic adhesions.

All these signs are unreliable, and disappointment will surely follow any great degree of confidence which is reposed in them, but a compensation is to be found in the fact already stated that even firm adhesions do not contraindicate removal.

The Pedicle.—The length of the pedicle is of no special importance, so far as ease of transfixing, ligation, or recovery is concerned. Small, high, and very movable tumors usually have long and thin pedicles. The thinner and longer the pedicle and the more movable the tumor, the more likely is torsion to occur. Of course a thin, slender pedicle is preferable to a thick, fleshy one, which latter requires much more force to ligate firmly; and a healthy pedicle is superior to one diseased by torsion or peritonitic exudation, and therefore liable to be cut by the ligation and to bleed. But otherwise it is of no value to endeavor to ascertain the length and size of the pedicle before operation; and indeed this can seldom be done.

When doubts exist upon any of the points here stated, which cannot be removed by those means of investigation which are limited by the abdominal walls and pelvic roof—which, in other words, extend to, but not beyond, the peritoneum in their immediate application—there exist three methods of exploration which bring the explorer into direct contact with the interior of the abdomen and of the tumor. These positive and reliable means, which may justly be styled the crucial tests of abdominal tumors, are the following:

Aspiration;
Tapping;
Explorative incision.

To these a certain amount of danger undoubtedly attaches, but when compared with the great danger arising from operation upon an uncertain diagnosis it becomes trivial. Many an inappropriate case has been submitted to the operation of ovariotomy which would have been spared it, with the promise of a prolongation of life, had one of these methods been previously employed. They are, of course, not to be confined to the determination of the character of a tumor alone, but that of the origin, attachments, and complications of any abdominal growth.

Aspiration.—The introduction of aspiration into use for the diagnosis of ovarian tumors constitutes a decided advance. The instrument generally employed in this country is that of Potain, shown in Fig. 28. By this a delicate, hollow needle is passed into the tumor, and powerful suction applied through an India-rubber tube connected with a strong syringe, in which a vacuum is created by an upward movement of the piston. Through the most delicate needle clear fluids will pass, and through the largest, which is very small when compared with an ordinary trocar and canula, very tenacious colloid material may be drawn. With the aspirator a supply of fluid for chemical and microscopical examination may be withdrawn. The danger of aspiration is much smaller than that of tapping, which latter may cause: 1st, hemorrhage from a blood-vessel in the abdominal or cyst-wall; 2d, admission of air to the cavity of the sac and decomposition of fluid, which may create inflammation of the cyst-wall and septicæmia; 3d, subsequent escape of the contents of the tumor into the peritoneum; and 4th, fatal injury from wounding of an intestine or solid organ. Spencer Wells mentions a case in which an acquaintance of his tapped a patient who died soon after. Upon autopsy two and a half quarts of blood, which had escaped from a wounded varicose vein, were found in the peritoneal cavity. A similar accident *per vaginam* occurred to Dr. A. Reeves Jackson of Chicago. All these dangers are considerable from ordinary tapping; decidedly less so from aspiration.

It may, then, safely be said that aspiration accomplishes all that tapping does, at infinitely less risk, and that the former should, when practicable, always be preferred to the latter procedure. When it is desired merely to obtain a small amount of fluid for examination, the hypodermic syringe may be employed, even in preference to the aspirator. [The use of this instrument, which was suggested by Dr. H. F. Walker and practised by myself before our knowledge of that just described, consists simply in plunging the needle with syringe attached through the abdominal walls at different points, drawing out as much fluid as possible, and expelling this into a test-tube for examination.—T. G. T.] This method serves to determine the following points: 1st, whether a tumor is fluid or solid; 2d, whether it contains clear, slightly albuminous fluid or ichorous and irritating material; 3d, by means of several punctures whether it be multilocular or not.

Although it has been stated that aspiration is much less dangerous than tapping, it must not be regarded as free from danger. Death has repeatedly resulted from it, and it should be regarded as an axiom that all abstraction of fluid from an ovarian cyst, by whatever means it is accomplished, is attended by danger. The smaller the puncture made, however, the less the danger, I think. Cases of peritonitis, some of them fatal, after aspiration, are recorded by Atlee, Little, Lusk, Mundé, Gillette, and Jenks; cases of decomposition of sac-contents and septic fever are reported from the same cause by Goodell, Peruzzi, Schnetter, Skene, and Thomas; and a case of peritonitis and adhesions after diagnostic puncture by a hypodermic needle by Fauntleroy of Virginia.

Tapping.—Tapping, although resorted to in previous years, indeed almost since time immemorial, has now been entirely discarded in the diagnosis and treatment of ovarian tumors, for the reason that it is not only unnecessary (the aspirator answering every purpose), but unsafe, and, according to Tait, productive of adhesions which greatly lessen the chances of recovery from a subsequent ovariotomy. According to Kiwisch, of 130 cases of tapping, 17 per cent. died within a few hours or days after the operation. As this mortality by far exceeds that from ovariotomy at the present day, tapping has naturally fallen into disuse.

The circumstances which ordinarily indicate the propriety of paracentesis as a palliative measure when immediate removal of the tumor is for some reason or other impracticable, are—rapid accumulation, which interferes with some important function; coexistence of ovarian disease with pregnancy; solitary character of the cyst; firm adhesions which bind the tumor down so as to prohibit a more radical procedure; great doubt as to diagnosis; or constitutional debility, which prevents the tolerance of a more serious operation. The operation may be performed through the abdominal, vaginal, or rectal wall, nearly always the first named.

Tapping through the Abdominal Wall.—This is done by a trocar, the skin being first incised under antiseptic precautions. The median line midway between umbilicus and pubes is the point preferred. The patient should be in the recumbent position, and the abdomen be well bound after evacuation of the fluid. The only instances in recent years in which we have resorted to tapping of the abdominal cavity have been not of ovarian cysts, but of ascites, which obscured the diagnosis of a pelvic or abdominal tumor.

Tapping through the Wall of the Vagina.—This procedure is limited now almost entirely to intraligamentous ovarian cysts, cysts of the broad ligament, or effusions of blood between the layers of the broad ligament (pelvic hematoma). It is followed by dilatation of the puncture with the divergent dilator and irrigation of the sac, which is either packed with iodoform gauze or drained through a large rubber tube. For description of this method we refer the reader to the section on Pelvic Hematoma.

Explorative Incision.—Of all the means for definite and certain settlement of the question of diagnosis in abdominal tumors, we esteem explorative incision most highly. As, however, it involves not only opening the peritoneal cavity, but usually considerable manipulation of its contents, it necessarily involves a certain amount of danger. While the other methods may be practised several days or even weeks before the operation of ovariotomy, this should constitute, or rather be merged into, its first step. If it yields information which makes the surgeon decide against operation, the opening made should be closed: if the light which it throws upon diagnosis favors the radical procedure, the incision should be at once enlarged and prolonged into the final abdominal opening.

Explorative incision should be thus performed: The patient having been prepared for the procedure exactly as if we had determined upon ovariotomy, she is placed upon the table and surrounded by assistants, etc., as in the case of the radical operation. An incision is then made by the bistoury upon the median line, one inch in length. This is carried down to the tumor, and the finger is at once gently swept over this in every direction, so as to ascertain its character. The tumor may be emptied with a *very small trocar*—so small that the opening made may be readily closed if it be deemed best to desist from radical operation—or by the aspirator. If the sac be emptied by this means, the hand is then passed into the abdominal cavity and complete exploration made. If it be not completely emptied, a sound should be passed into the uterus and two fingers or the hand carried down through the abdominal opening to the fundus uteri, to ascertain as accurately as possible the origin and attachments of the solid mass. In case abdominal effusion have existed, this of course at once flows away, and any growth existing in the abdomen comes within the reach of the finger.

Before leaving this part of our subject let us lay before the reader a few rules, the observance of which will diminish very greatly the chances of his falling into errors of diagnosis in operating for ovarian tumors:

1st. Never perform ovariotomy without carefully exploring the uterus by the sound, if this be possible.

2d. Before operation, should doubt exist as to diagnosis, always remove a small amount of fluid by the hypodermic syringe or aspirator for chemical and microscopical examination.

3d. If any doubt whatever exist as to diagnosis, anæsthetize the patient and examine carefully.

4th. Should all doubts not be cleared up at the moment of operation, begin it as an explorative incision, and proceed or not as instructed by what is discovered.

Treatment.—The medical treatment of ovarian dropsy by diuretics, hydragogue cathartics, diaphoretics, mercurials, absorbents, mineral waters, etc. has now been faithfully tested and found to be inefficacious. After a careful search through the records of the subject, one is forced to the conclusion that there is a lack of evidence substantiating the possibility of the accomplishment of absorption by these means. All that can be anticipated in these cases from medication is sustaining the nervous and sanguineous systems by tonics and stimulants; regulating disordered functions by diaphoretics, cathartics, diuretics, and anti-emetics; and relieving local inflammations by the ordinary means usually resorted to under such circumstances. We are the more urgent in insisting upon the fact of the inefficacy of constitutional treatment because we formerly met with many fully-developed cases of ovarian cyst which bore evidence of a variety of attempts by cupping, leeching, inunction, painting with iodine, and correspondingly active internal treatment to dissipate the accumulation. To the attempts to obliterate ovarian cysts by the injection of tincture of iodine (a great advocate of which twenty-five years ago was Boinet) we need but refer as a matter of history. The same applies to Semeleder's project to cure these cysts by electrolytic puncture, a proposal made as late as 1876, and, we believe, still upheld by its author. Mundé[1] showed the danger and futility of this practice, which at present has no supporters whatever, even among the most enthusiastic electro-therapeutists. Very small cysts may occasionally be absorbed or cured by local alterative and counter-irritant treatment. Winckel[2] mentions one case of a tumor of the size of an apple which was reduced by the steady use of brine baths (Kreuznach, Hall, or Tölz) to about normal size. Monocysts not larger than an egg have several times been ruptured accidentally, and intentionally by bimanual pressure by Noeggerath and Mundé[3] without evil results.

But the fact nevertheless remains that there is only one sure cure for an ovarian tumor, and that is its removal. It is entirely unnecessary at the present day to discuss or defend this question, which is definitely settled for all time.

CHAPTER XLIV.

OVARIOTOMY.

Definition.—Ovariotomy consists in the extirpation of the diseased ovaries. At the present day this term is used only to designate the removal of an *ovarian tumor*. The extirpation of ovaries not so diseased as to be worthy of the name of "tumor" is called "oöphorectomy."

History.—The history of ovariotomy goes back only to a very recent date. It has become customary for those who have written upon it to cite ancient authors to prove that even as long ago as the time of the early Greeks the ovaries were often removed in the inferior animals, as is done in our own time. The writings of Aristotle put this beyond question. It is even asserted that among the Lydians castration of the human female was practised in order to enable them to serve as eunuchs. In more recent periods we are told by Wierus that a Hungarian swineherd, incensed by the lasciviousness of his daughter, removed her ovaries in hope of reformation, after the manner in which he was in the habit of spaying his swine. Toward the close of the eighteenth century both ovaries, which had descended into the inguinal canals, were removed by Dr. Percival Pott of England. But all this, though interesting as a matter of history, has little to do with the operation of ovariotomy, according to the true signification of the term. In the one case a minute and healthy gland, which is sparsely supplied with blood, was removed from a healthy peritoneal cavity. In the other a huge sac, which is supplied by large blood-vessels and has in many instances contracted adhesions to a diseased peritoneum, requires extirpation.

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[1] Mundé, *Amer. Gyn. Trans.*, 1877.

[2] *Loc. cit.*, p. 557.

[3] "Trans. N. Y. Obst. Soc.," *Am. Journ. Obst.*, 1876.

The idea of removing large ovarian cysts, even, is not new, since it was discussed in 1685 by Schorkopff, in 1722 by Schlenker, in 1731 by Willius, in 1751 by Peyer, and in 1752 by Targioni. In 1758, Delaporte even went so far as formally to propose the operation to the Royal Academy of Surgery. As the eighteenth century approached its close the suggestions of the writers already mentioned were not forgotten, but were from time to time repeated, among others by John Hunter in 1787, and later still by William Hunter. In 1798, Chambon ventured to prophesy that it would in time become a recognized resource in surgery; and in 1808,[1] Samuel d'Escher, a student of Montpellier, proposed a specific plan for its performance based upon the teachings of one of his masters, M. Thumin.

In 1786 one observer stood upon the very verge of the great discovery, very much nearer than Laumonier, by some supposed to be the discoverer, ever did, and yet failed to systematize it as a surgical resource. Like many a man before and since his time, he recognized and appreciated a *fact*, but failed to connect this with a *law*. The following is a quotation from a work written by Thomas Kirkland, an Englishman, and published in London in 1786. It is entitled *An Inquiry into the Present State of Medical Surgery*:[2]

> "A woman, betwixt twenty and thirty years of age, had been tapped twice for an ascites, and a large quantity of water taken away at each time; but after the last operation the puncture did not heal, and in a little time, a substance they did not understand protruding, I was desired to see her. It was evidently a part of a cyst, and, as it had already dilated the sore, I persuaded her to let it alone till the opening became larger, in hope of a better opportunity of affording relief. Accordingly, in ten days or a fortnight the protrusion was much larger, and by the help of a dry cloth a cyst that would contain five or six gallons of water was gradually extracted. More than a quart of matter immediately followed, and more was daily discharged for some time, yet the woman recovered without further trouble than keeping the parts clean, and afterward bore several children."

Later on in his work he says:

> "We have given an instance (p. 195) where a cyst being taken away cured an ascites; and, seeing medicines do not avail in encysted dropsies of the abdomen, is it not worth our while to consider whether, when they are unconnected with the adjacent parts, after taking away the water, the patient might not sometimes be cured by enlarging the puncture, pressing the cyst forward, and drawing it out?"

He then proceeds to examine the difficulties in the way and the objections which may be brought against the operation, and thus concludes:

> "At present I offer these hints to those who think the subject deserving attention, and time will probably determine the question."

Thus, as we advance from more remote periods to the beginning of the nineteenth century, we find the minds of physicians being gradually prepared for the reception of ovariotomy as its consummation was step by step approached. But all that we find accomplished up to this time is the promulgation of ideas, prophecies, and propositions, and the performance of accidental operations or of those upon healthy ovaries.

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[1] Wieland and Dubrisay, French translation of Churchill on *Dis. of Women.*

[2] *Med. Record*, June 15, 1867, from exchange.

In 1809 the first real case of ovariotomy ever undertaken was successfully performed by Dr. Ephraim McDowell of Kentucky. His first case was successful, the patient living twenty-five years afterward. Subsequently he operated 13 times, with 8 favorable results. It may confidently be asserted that the history of no operation has been more thoroughly sifted than this, and that up to the present time nothing can be clearer than the fact that to McDowell belongs the credit of priority of performance. It is interesting to examine the competitive claims which have been put forward in reference to the matter. First in chronological order is that of Dr. Houstoun[1] of Scotland, who operated in 1701, and whose case, says Mr. Wells,[2] makes it "appear that ovariotomy originated with British surgery on British ground." This statement will excite wonder, and the claims of the operator fail to attract attention when it is stated that nowhere does Houstoun claim to have removed the cyst or even a part of it. He merely treated a case of ovarian cyst successfully by incision.

The second is that of Laumonier of France. Of him Baker Brown says: "The first who attempted extirpation appears to have been Aumonier of Rouen in 1782, and he was successful." In this statement, as Dr. Parvin has pointed out, Mr. Brown was wrong in three points: first, as to the fact; second, as to the name of the operator; and third, as to the date. The supposed ovariotomy was performed in 1776 by Laumonier, and was really the opening of a pelvic abscess.

The third is that of Dzondi of Halle. As the patient was a boy, the claim requires no further consideration.

In 1821, Dr. Nathan Smith of this country operated successfully. He was from New Haven, Conn., but was lecturing at Dartmouth Medical College. His operation was performed in Norwich, Vermont, the ligatures used being strips cut from the buckskin gloves of the operator. The pedicle was dropped. In 1823, Dr. Lizars endeavored to introduce the operation into Scotland, and operated four times, but his results were bad. In one case the tumor was uterine and was not removed; in one no tumor could be discovered after abdominal section; and one of the two cases upon which ovariotomy was performed died.

Since this period, Atlee, Peaslee, Kimball, and Dunlap were most influential in establishing the operation in America. In England, Dr. Charles Clay in 1840 pressed it upon the notice of the profession, and he was soon ably sustained by Lane, Wells, Keith, Bryant, Baker Brown, and many others whose names have become famous in connection with it.

"It is only within the last five years," says Grenser, writing in 1871, "that much progress has been made in Germany in this operation." Unfortunately, for many years insuccess appeared to attend it, and thus the voices of the most eminent and authoritative were raised against it. Of the first 3 patients ever operated upon there (by

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[1] *Amer. Journ. of Med. Sciences*, vol. ii., 1849, p. 534.

[2] *Op. cit.*, p. 299.

Chrysmar in Würtemberg), 2 died. Chrysmar commenced operating in 1819, and his results were certainly not such as to popularize a new and dangerous procedure. In 1828 the adverse criticism of the great Dieffenbach was pronounced in these strong terms: "Whoever[1] considers the opening of the abdominal cavity as a light matter, and, as Lizars seems to believe, that the difficulties are small; whoever thinks that this operation is accompanied by no more dangers than other operations, must be very thoughtless; for me, my one case is sufficient." The "one case" to which he refers, and from which he drew so illogical and hasty a conclusion, was an incomplete operation. In spite of the adverse weight of this opinion, in 1835 Quittenbaum, in 1841 Stilling, and in 1851 Martin, operated on a few cases and with varying success. Writing of the operation at this time, when, overclouded by repeated insuccesses, it had failed to command the confidence of the profession, Grenser says: "Most of the ovariotomies performed within the last forty years had a fatal termination, and as a consequence reliance could not be felt in it, and confidence in it was altogether shattered when the celebrated Dieffenbach took ground against the operation." Dieffenbach's opinion in 1828 has been given; let us see how the experience of twenty years affected it. In 1848 he wrote: "The operation does not benefit either patient or physician; the idea of opening into the abdomen of a sick, cachectic woman, affected with a hard tumor of the ovary, or even employing Lizars' method with cross-incisions, in order to remove the tumor by force, seems neither reasonable nor useful." He modified his opinion somewhat where the tumor was fluid, of small size, and movable. Thus wrote the great surgical light of Germany, and while he wrote American and English surgeons were gaining great results for humanity and for science in this same field. It must not be supposed that even in his own country advances were not being made, for Stilling, Büring, and others were carrying on the work. In 1850 the latter announced an important advance—namely, that adhesions should not be considered as a contraindication to removal.

In 1852, Edward Martin declared that the question was no longer as to the propriety and efficiency of ovariotomy, but of circumstances favorable to success. Martin's rules for operating, read even by our present lights, are most of them excellent.

About this time the voice of Kiwisch was raised against the operation. He[2] collected the statistics of 54 cases, of which 51 ended fatally, and concluded that certainly over half of all submitted to operation died. It was soon after this that Scanzoni and Gustav Simon gave their evidence against the operation, and increased its disfavor to such a degree that, as Grenser says, "its very existence was threatened." This opposition seems to have lasted up to 1864, when the tide appeared to turn in its favor, and it soon numbered among its advocates Breslau, Gusserow, Hildebrandt, Spiegelberg, Martin, Stilling, Veit, Wagner, and Billroth. Grenser collected in 1871 the statistics of 129 operations performed in Germany, of which 60, a little less than half, recovered. When these results are compared with English and American statistics of that period, they show that

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[1] Grenser, *Report on Ovariotomy in Germany.*

[2] Grenser, *loc. cit.*

Germany had much to make up. That she has done this is proved by the excellent results obtained by Schroeder, Olshausen, Martin, Leopold, Gusserow, Fritsch, Winckel, Chrobak, Peter Müller, Hegar, Sänger, and others too numerous to mention; and to-day it must be conceded that in Germany the operation of laparotomy, whether for ovarian tumors or other abdominal diseases, has attained a perfection second to no other country.

According to Grenser, we owe to Germany two of the most important of the improvements which have taken place in the operation since the days of McDowell: first, the adoption of the short incision and tapping the sac *in sitû*, which originated with Quittenbaum; second, the external treatment of the pedicle, which he declares was first resorted to and its advantages insisted upon by Stilling in 1841, and not by Duffin in 1850. In 1849, Martin first secured the pedicle in the lips of the wound. There are other advances which have been made in Germany, but we mention only those which have had a decided influence on the operation.

Into France the operation was introduced, or, as some French[1] writers express it, "reintroduced," by Dr. Woyerkowski in 1844. It was subsequently performed by Vaullegeard in 1847, and later still by Nélaton, Maisonneuve, Jobert, Demarquay, and other surgeons of Paris. The results of these attempts, however, had the effect of casting discredit on the operation, from which it is only now emerging, thanks to the writings of Jules Worms, Ollier, Labalbary, Vegas, and more especially to those of Koeberlé of Strasbourg. When it is stated that all these writers have published since 1862, it will be appreciated how recent is the favorable reception of the operation in France.

M. Boinet in 1867 read an essay before the Academy of Medicine: strongly advocating it, and "reprobating the timidity of French surgeons who have so long recoiled before it."

Up to July, 1868, Péan of Paris had had 7 recoveries out of 10 cases, and in 1870 and 1871, out of 32 operations 26 recoveries took place. In 1873 he wrote a work upon *Hysterotomy for Fibroids and Fibro-cysts*, in which he claims 7 recoveries for 9 operations. Nothing could more surely mark the advance of the operation, as well as the rapidly increasing boldness and skill of French surgeons, than this announcement.

It is needless to point out the fact that to-day all opposition to the operation has disappeared, and that in every civilized country of the globe it stands among the proudest achievements of surgery.

In concluding the history of ovariotomy it may be said that the conception of the operation in all its steps is over a hundred years old, and is of European origin; that for its accomplishment we are indebted to what M. Piorry once styled "une audace Américaine," which was supplied by Ephraim McDowell; and that many of the important improvements which have since been introduced we owe to Great Britain. Pre-eminently an Anglo-American procedure, it has only within the last twenty years assumed its legitimate place in Germany and France. But the former country has since then distanced all competitors by the enormous strides which ovariotomy and abdominal section for other indications have made. No case seems too hazardous for the German laparotomist, and his successes, it must be admitted, justify his boldness. France has lately been coming rapidly to the front under the guidance of the younger generation. In our own land ovariotomy is so frequently practised as to be no longer a subject for comment, and American laparotomists need not fear comparison with the best of other countries.[1]

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[1] Wieland and Dubrisay, the French translators of Churchill.

Varieties.—There are two forms of the operation: one, abdominal ovariotomy, in which the cyst is removed through the incised abdominal walls; the other, vaginal ovariotomy, in which a small cyst is removed by incision through the fornix vaginæ. Incomplete cases, or those in which only a portion of the sac is removed, have also been grouped under the first head, since in its essential details the steps of the operation are the same up to the point when the possibility of the entire removal of the tumor is decided or it becomes apparent that a portion of it will have to be sewed into the wound.

Dangers.—The removal of an ovarian tumor differs in one great particular from many other operations, chiefly of the plastic variety. In these the operation may be a success or it may fail, but in either case the patient may recover, and be but little the worse for the risk and inconvenience he or she has experienced. But in an ovariotomy the case is different: here success means recovery. It is true the tumor may be successfully removed, and still the patient die. But that could hardly be called an operation with a successful result. On the other hand, failure to remove the entire cyst may still be a success, since the remnant left behind may shrink and close by granulation, and the patient eventually make a perfect recovery. Our own observations would lead us to put the causes of fatal issue after ovariotomy in the following order as to frequency and importance:

Septicæmia;
Peritonitis;
Hemorrhage;
Shock.

The first of these is the great evil to be feared, and, combined with the second, causes more deaths than all the causes added together and multiplied by ten.

Statistics.—So hard was the struggle of ovariotomy for existence, so vigorous and malign the attacks made against it by the leaders of professional opinion all over the world, and so delicate the position of those bold and enterprising men who in the United States and England still clung to its fortunes, that up to a very recent period it was necessary to deal fully with statistical evidence endorsing it. That time has now happily long since passed, ovariotomy now standing upon a basis every whit as firm as that of amputation of the leg or any other long-accepted operation of general surgery. Then, too, since the universal introduction of antiseptic precautions results have been achieved which are simply marvellous, and which only so short a time as ten years ago would have been thought impossible. As in the major operations, the greater the skill of the operator the better usually his results. Skill is attained only by experience. Hence successive series of ovariotomies, published by the same operators, generally show a decreasing number of deaths, and those surgeons who have done many such operations as a rule have a greater number of recoveries to show than operators whose total of operations is small. At present the average mortality among 100 unselected ovariotomies might fairly be put at about 10 per cent. This figure may vary three to five points either way in proportion to the accidental greater or lesser frequency of unusually difficult cases. Dohrn,[1] of 100 ovariotomies performed between 1883 and 1889, lost but 4. Tait in his first series of laparotomies (which, by the way, does not mean ovariotomies only, but removals of diseased tubes, ovaries, etc.) reports a mortality of 9.2 per cent., and in a second similar series of 5.5 per cent. C. Braun[2] in a second series of 100 cases had 93.5 per cent. of recoveries. Bantock[3] in his fourth 100 cases lost but 4 (employing merely *aseptic* precautions), whereas in his first 100 cases, where he followed the Listerian practice of drenching the patient and all her surroundings in a weak solution of carbolic acid, he lost 19.

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[1] [I remember distinctly how in 1867, when I was assistant to Prof. Scanzoni at the Maternity Hospital in Würzburg, the instruments for ovariotomy were procured from Prof. Koeberlé at Strasbourg (who was the pioneer of the operation on the Continent), and how elated all concerned were when the patient recovered. It was a simple case, and nowadays would attract no attention or merit report. Then it was a great achievement, which warranted its publication. One more successful case followed, and then a death, which promptly cooled the ardor of Scanzoni.—P. F. M.]

The following table is copied from Olshausen (*loc. cit.*):

Spencer Wells,	1000	cases,	with	768	recoveries.
Keith,	281	"	"	340	"
Koeberlé,	306	"	"	340	"
Thornton,	423	"	"	383	"
Tait,	405	"	"	372	"
Olshausen,	293	"	"	266	"
Schroeder,	658	"	"	575	"

Hofmeier has arranged the cases of Schroeder according to each hundred, in order to compute the different rates of mortality with the increasing experience of the operator:

From	1–100	17	deaths.
"	100–200	18	"
"	200–300	7	"
"	300–400	16	"
"	400–500	7	"
"	500–600	7	"
"	600–658	11	"
From	658	83	deaths, or 12.5 per cent.

In explanation of the large mortality of Schroeder's last 58 cases it should be stated that there was an unusual number of malignant tumors.

The operation is thus shown to be a comparatively safe one—certainly one not to be feared either by patient or operator, in view of the almost certain fatal result which non-interference with the tumor will bring in the course of a few years.

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[1] Dohrn, "Ein Hundert Ovariotomieen aus der Kœnigsberger Frauenklinik," *Centralbl. f. Gyn.*, No. 9, 1890.

[2] *Wiener kl. Wochenschr.*, 1888.

[3] *Brit. Gyn. Journ.*, 1889.

Conditions Favorable to the Operation:

Clearness and certainty of diagnosis;
Good constitutional condition;
Patient hopeful and desirous for operation;
Paucilocular character of cyst;
Absence of much solid matter in its structure;
Abdominal walls not very thick;
Absence of strong pelvic adhesions.

The possibility of error in diagnosis has been already sufficiently dwelt upon. The importance of clearly understanding the nature of the tumor cannot be over-estimated. The operator should, by repeated and most careful examinations, alone or with counsel, endeavor to determine all the features of the case—not merely the fact that a tumor exists, but that it is ovarian and not uterine, that pregnancy does not exist with it, that it is not cancerous, that its contents are fluid, and that the fluid felt is all ovarian and none of it abdominal. [In two cases I have, in company with a number of others who consulted with me, been greatly deceived. In one case, when upon the point of operating upon a large, multilocular tumor, the patient lying on the table, I discovered the coexistence of pregnancy in the fifth month. In another, which I supposed to be a large ovarian tumor, upon cutting through the abdominal walls an immense amount of fluid escaped, leaving for removal a solid tumor of the ovary not larger than the adult head.—T. G. T.] Cases are on record in which surgeons of great experience and skill have cut down upon uterine fibroids, cysts of the kidneys, the pregnant uterus, and other abdominal enlargements under the impression that ovarian cysts existed, and instances have occurred in which abdominal section discovered no tumor of any kind, the operator having been deceived by tympanites.

As to the period at which the operation should be undertaken, there formerly was a great deal of diversity of opinion. Thus, Baker Brown operated quite early, as soon as the diagnosis was fully established, in order to avoid changes in the cyst and peritoneum. Peaslee, Tyler Smith, and Keith waited for some degree of impairment of health and emaciation, as the object in waiting was to toughen the peritoneum against inflammation. But this precaution is now admitted to be entirely unnecessary. Wells operated when the patient could not walk a mile without difficulty.

The practice generally in vogue at the present day, with which we substantially agree, is that any ovarian cyst which has attained a size meriting the dignity of that title (to fix an arbitrary limit) should be removed by abdominal section as soon as discovered. This rule may seem too positive and absolute to many conservative surgeons, and indeed ten or fifteen years ago it would probably have been an unwarrantable interference with a condition which as yet was not giving rise to any particular trouble, and possibly might never do so; but our vastly increased experience at the present day justifies us in advising the early removal of ovarian cysts, in view of the comparative safety of the operation, and chiefly in view of the accidents to which every ovarian tumor is exposed—namely, the twisting of the pedicle, the inflammation and suppuration of the cyst, and the formation of adhesions which may render its removal exceedingly difficult or even entirely impossible. Particularly if pain in the region of the ovarian tumor and signs of local inflammation exist is an early removal imperative. We prefer at present the abdominal operation. In the last edition of this work the removal of small ovarian tumors by the vagina was advocated and described at some length, this method having first been recommended and practised by Thomas. It has recently been performed a number of times with fair success by Henry T. Byford of Chicago, but at the present day there seems no particular reason for substituting another form of ovariotomy for that by abdominal section, which answers every purpose, both as to facility of operation and certainty of result. Hence vaginal ovariotomy, while perfectly feasible, and indeed not particularly difficult or dangerous, can scarcely be said to be the favorite operation at present. The reason for this may be the limited field through which the operator is obliged to work, and the ever-present uncertainty, before the peritoneal cavity is opened, whether it is possible to remove the tumor by the vagina or not. Extensive adhesions, for instance, might prove an insuperable obstacle to the completion of the operation, and would necessitate an additional abdominal section.

In former days the mental condition of the patient was supposed to influence very decidedly the result of an ovariotomy. Undoubtedly, a woman with a cheerful disposition, who has made up her mind to recover, stands a better chance than one who either does not care or is convinced that she is going to die; but we have seen even patients with the latter frame of mind recover without any drawback whatever; hence the mental disposition of the patient is at the present day not regarded with as much apprehension or anxiety as formerly. A nervous, excitable state of mind, which induces the patient to fret and worry constantly about the presence of an ovarian tumor and the possibility of an impending operation, would induce us to advise as early a removal of the tumor, and with it the cause of the mental disturbance, as possible. But this would only be an additional reason for an early operation, the true reason being the actual presence of an appreciable ovarian tumor. The older operators laid great stress upon the effect of the general health of the patient on the prognosis of the operation. Thus, some believed that as long as the woman was strong and showed no constitutional effect of the tumor an operation should not be performed, because it would be more likely to be followed by inflammatory reaction—that is to say, peritonitis; hence they waited until emaciation of the patient had progressed to an extent which in many cases undoubtedly rendered her incapable to rally from the shock of the operation. Their idea was that the pressure produced by the growing tumor rendered the peritoneum tough and little disposed to inflammation. Of course it is understood that the depreciation of the general health must be due only to the cachectic influence of the ovarian tumor, not to organic disease of heart, kidneys, liver, or other vital organs. We know now that nothing is gained by allowing a woman's general health to deteriorate under the painful influence of a large ovarian tumor, since there is no more danger of peritonitis under proper antiseptic and antiphlogistic precautions in the early stages of the disease than there is gained in waiting until the system has become debilitated and the peritoneum toughened by the growth of the tumor. Statistics of 299 cases collected by Dr. J. Clay at a time when this delay was still practised show that the results of the operation in patients whose health was still good, and in others where it was impaired, are very nearly equal.

The greater amount of solid matter in an ovarian tumor to a certain extent influences the rapidity and difficulty of the operation, and therefore also the chances of recovery; but this influence is relatively slight when compared with the presence of extensive adhesions, chiefly to vital organs, such as intestines and liver, and the general condition of the patient. It may be accepted as an unquestioned rule that the stronger the patient, the better her general health, and the less debilitated she is either by the tumor or by disease of other organs, the better, *cæteris paribus*, no matter what the complications may be, her chances for recovery.

Conditions Unfavorable to the Operation.—The following circumstances, although unfavorable to the operation, do not contraindicate it unless they exist in the most exaggerated degree:

Obscurity as to diagnosis;
Great constitutional impairment;
Extensive and firm adhesions to viscera;
Complication with other diseases (kidneys, liver, heart, and lungs);
Great thickness of abdominal walls.

Abdominal Ovariotomy.

As is the case with many other operations, each surgeon has his own peculiar method, and no two operators quite agree in all the details of the operation. It is manifestly impossible for us to reproduce the method of each operator, differing as each does very often only in minor points. We have therefore decided to describe the operation of ovariotomy as we do it ourselves, and as we think it is performed substantially by the majority of abdominal surgeons.

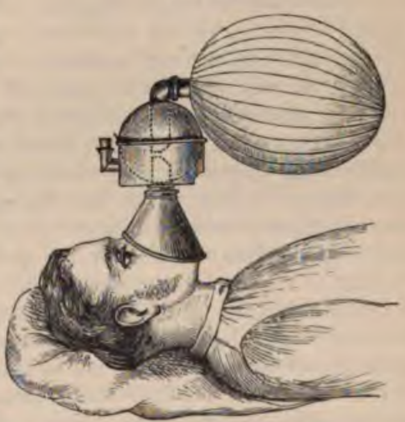
Preparatory Treatment.—As soon as the presence of an ovarian tumor is discovered and an operation decided upon, as early a date as possible should be fixed. In the mean time, the general health of the patient should be attended to, her bowels regulated, tonics such as iron and quinine prescribed if necessary, daily tepid baths taken in order to increase the activity of the skin, open-air exercise advised in accordance with the patient's strength, and everything needed be done to fit her for the ordeal which she is to undergo. Her mind should be set at rest by informing her that her chances for recovery are exceedingly good, and that she need be in no anxiety about the success of the operation; and her friends should be enjoined to share this feeling if they can, or at all events impress the patient to that effect. Of course, the time intervening between the discovery of the tumor and the date fixed for the operation will usually be short, since at the present day long and unnecessary delays in removing the tumor are considered inadvisable in consequence of the possible accidents which may occur at any time without the slightest warning in every case of ovarian cyst. These have already been referred to, and we will merely repeat that they consist in twisting of the pedicle, inflammation and suppuration of the cyst, peritonitis, and adhesions. Therefore very little opportunity will generally be given to carry out the above tonic rules; still, usually a few days to a week will elapse, and this time will be sufficient to at least regulate the bowels and act favorably upon the skin.

Formerly it was thought best to select a clear, dry, and bright day for the operation, neither too hot nor too cold; and this was considered quite a serious matter. At present very little importance is attached to the kind of weather which may happen to prevail on the day chosen for the operation. Of course, a bright day is preferable to a dark day, but simply because the operator can see better by a bright sunlight. As far as the recovery of the patient is concerned, the weather seems to bear no influence. This may be accounted for by the practice of keeping the operating room at as nearly an equable temperature, between 70° and 75° F., as possible, no matter what the weather may be outside. The time of year at which an ovariotomy is performed is also of no special consequence, with the sole exception that when the weather is very hot the operation, as well as all other operations of election—that is to say, that are not urgent—had better be postponed until cooler weather, simply because confinement to bed during great heat is irksome to the patient, and by interfering with her comfort may disturb her convalescence. Some months of the year, such as March and April, in which in our climate there is a great deal of moisture from the melting snow and the frequent rains, have also been supposed to be unfavorable to convalescence from capital operations; this we believe, however, to be a fallacy. As regards the time of day at which an ovariotomy should be performed, the convenience and leisure of the surgeon have to decide. The Germans prefer operating early in the morning, before the labors of the day have to a certain extent brought on both physical and mental fatigue. Besides, fresh from his bed and from a bath, the surgeon may be said to be absolutely aseptic. In England and this country, however, a later hour in the day is chosen, simply, we think, because more convenient to the surgeon, and the latter, taking the same antiseptic precautions as his German brother, has practically equally good results.

It was formerly believed, and many operators still think, that the proximity of the menstrual period is a counter-indication to the performance of ovariotomy or indeed of any operation on the female sexual organs. While this is undoubtedly correct, so far as it applies to an operation on parts with which the menstrual blood comes in contact, it does not hold good in abdominal sections, which do quite as well when performed immediately before or even during the menstrual period as at other times. We have repeatedly found ourselves obliged to do an ovariotomy or remove the diseased ovaries and tubes on the very day when unexpectedly menstruation had set in, the operation having already been announced and prepared for, and in no case do we remember having to regret such action. The only exception to this statement might be the operation for removal of fibroids by abdominal hysterectomy, when the greater hyperæmia of the parts might possibly produce hemorrhage which would not at other times take place. The only precaution to be observed is to cover the vulva with a bichloride pad, so as to prevent any possible infection of the abdominal wound from the menstrual blood.

Anæsthetic.—The choice of the anæsthetic to be used in ovariotomy depends on the predilection of the operator and upon the condition of the heart and kidneys. The favorite anæsthetic in this country is sulphuric ether; in England, chloroform, ether, and the bichloride of methylene are employed; in Germany and France, almost exclusively chloroform. Some operators use the triple mixture of ether, chloroform, and alcohol, equal parts. We ourselves prefer ether for the majority of cases, but our choice between ether and chloroform will be decided by the results of the examination of the urine and of the heart. If there is any evidence of renal disease, as shown by the presence of albumin or casts, ether should be avoided and chloroform employed. Further, if there is any bronchial irritation or sign of chronic pulmonary disease, ether should be avoided. We believe that we have seen acute bronchitis and even pneumonia produced by ether anæsthesia. If the heart is found weak, flabby, its pulsations feeble and intermittent, chloroform should be avoided, and ether, which is a heart stimulant, administered. It must be left to the judgment of the physician who administers the anæsthetic whether he thinks it wise to change from ether to chloroform or the reverse during an operation. We do not think it best to aid the anæsthetic by the previous administration of a hypodermic of morphine in any abdominal section, as we might do in other operations. Our reason for not wishing to give morphine in an abdominal section is, that it tends to check peristaltic action of the intestines and interfere with our efforts to move the bowels soon after the operation.

FIG. 311.



Clover's Ether Inhaler.

Operating Room.—In public and private hospitals ovariotomies will usually be performed in the general operating room, or even in a room specially reserved for abdominal sections. This room will of course be fitted up in such a manner as to enable it to be rendered easily and thoroughly aseptic, the walls, ceiling, and floor being of impermeable material which can be scrubbed and drenched with disinfectants without affecting its integrity. In private houses the room selected for an abdominal section should be prepared for the operation by removing the carpets, hangings, curtains, and all movable furniture; by scrubbing the walls, floor, and ceiling thoroughly with a 1 : 2000 bichloride solution, and by fumigating the night before with sulphur. If all these precautions are taken, abdominal sections can be performed with as much safety in the general operating room of a public hospital or in private houses as they can in rooms specially reserved for that operation.

Instruments, Sponges, Gauze, etc.—The instruments required for an ovariotomy may briefly be summed up as follows:

1 sharp-pointed bistoury;
1 straight blunt-pointed bistoury;
2 mouse-tooth forceps;
2 straight or slightly curved blunt-pointed scissors;
1 dozen artery forceps;
3 long double vulsella forceps;
At least 6 long straight pressure forceps (Tait's);
3 flat grooved pressure forceps (pince crémaillère);
1 cautery pedicle clamp;
2 long blunt-pointed pedicle needles (Deschamps'); one straight, the other curved at right angles;
At least 6 long, straight, curved needles for the abdominal sutures;
Plenty of strong braided or twisted silk, strong catgut, and strong silkworm gut.

At least a dozen sponges, prepared and sterilized, of the size of an egg, for use on an equal number of metal sponge-holders. Further, at least a half dozen larger sponges, similarly prepared, for use with the hand. Then three or four large flat sponges, at least a foot square, also thoroughly sterilized, to be used in holding back the protruding intestines or protecting the abdominal cavity while introducing the closing stitches. [I have for a number of years entirely dispensed with these large flat sponges, finding them difficult to keep clean and liable to be rendered friable by the repeated sterilizing process, in consequence of which pieces were liable to be torn off and possibly left behind in the abdominal cavity. To use new sponges of this size at each operation was rather expensive, hence I have substituted for them pads six inches long by four inches wide formed of thoroughly sterilized cheese-cloth or gauze, with strings attached, which are destroyed after each operation. These are cheap, can be supplied readily at short notice, and answer every purpose for which I formerly employed sponges.—P. F. M.] The numbers of sponges on holders, loose sponges, and pads of gauze are to be counted and marked on a blackboard or on a piece of paper in plain sight before the operation, and these figures must tally with the several articles on hand before the abdominal cavity is closed. The same rule applies to the instruments. In this way the anxiety of accounting for a missing sponge, forceps, or other instrument can easily be prevented, and a search for the missing article, possibly in the already closed abdominal cavity, rendered unnecessary. We need but mention that sponges and artery forceps have been repeatedly forgotten in the abdominal cavity, sometimes to the fatal detriment of the patient, at other times, curious to say, being discharged in course of time by suppuration, with eventual recovery. A number of agate-ware basins for keeping sponges, towels, pads, and for the reception of the cyst fluid, should be on hand. Further, plenty of boiled water which has thus been sterilized, and which should be kept warm on a gas or oil stove; also a gallon of Thiersch's solution (salicylic acid, 1 part; boracic acid, 4 parts; to 1000 parts of water).

It should be specially noted that no sponges, gauze pads, or towels which are to be used in contact with the wound or introduced into the abdominal cavity should be soaked in a solution of bichloride, no matter how weak; neither should any solution containing that chemical be poured into the abdominal cavity. The bichloride solution used in sterilizing the sponges, pads, etc. is washed out in hot water just before the operation; hence there is no danger of constitutional mercurial affection.[1]

A Paquelin thermo-cautery, which should have been tested just before the operation, should be in readiness, the tip which we generally use being the flat, slightly curved knife.

Operating Table.—Any plain, thoroughly cleansed, and asepticized board table will answer for the operation. It should of course be of sufficient length to hold either the whole figure of the patient from top to toe, or at all events from vertex to knees, the feet being allowed to rest on a chair. There are numerous more or less complicated operating tables in the market, devised by different surgeons. The simplest and most easy to keep clean is probably that of Frau Horn, the matron of A. Martin in Berlin, which is made of galvanized iron, and is merely a skeleton, the centre-piece being removable in order to permit the application of the circular bandage after the operation. It is not worth while to go into details on this subject, since he who is not satisfied with the plain deal table referred to will probably construct one to suit his own fancy. The foot of the table may be elevated by putting two blocks under the legs of any height desired. The object of this is to elevate the pelvis, and it will be found a very useful position in many cases of abdominal section where it is desired to remove the intestines by gravitation from the pelvic brim and the field of operation in order to lay the latter bare for inspection and manipulation. This position, in a much more exaggerated degree, was first devised by Trendelenburg, now professor in Bonn, for suprapubic cystotomy operations, and he has had a special table made for this purpose.

Assistants.—While it is desirable to have as few outsiders in a laparotomy room as is consistent with the successful performance of the operation, it really makes very little difference nowadays how many are present, provided all carefully observe the antiseptic precautions without which no surgical operation is now performed. We prefer to have three assistants, without whom we think the operation is likely to be delayed: one gives the anæsthetic (and we might here remark that an experienced man, no young beginner, should be chosen for this office); another, who is the chief assistant, stands opposite the operator and helps him during the various steps of the operation; and the third hands the instruments, threads the needles, and guards all that appertains to this part of the operation. In addition there are two nurses required, one of whom washes and hands the sponges to the operator or his first assistant; the other changes the water for the sponges, passes the boiled water or Thiersch's solution when required, and makes herself generally useful. It is this nurse who, in the absence of a convenient spectator, can be taught to prepare the Paquelin thermo-cautery and hands it to the operator when the time comes to use it. Operator, assistants, and nurses should all have rendered themselves thoroughly aseptic on the day of operation, should have taken a warm soap-bath on that morning, if necessary using sublimate solution 1 : 2000 to remove any possible infection with which they may have come in contact during the previous twenty-four hours. They should have a complete change of linen and clothes, which are either entirely fresh from the wash or have never been exposed to septic infection. Their finger-nails should be trimmed short and smooth and thoroughly cleansed just before the operation; each participant in it scrubs his or her hands and forearms up above the elbow first with soap, and then immerses them in a solution of bichloride of mercury 1 : 1000. After any accidental contact with an object not thus sterilized, such as the clothes of a spectator, the operator's own head, etc., the hands should be immediately bathed in the bichloride solution before proceeding with the operation. Any

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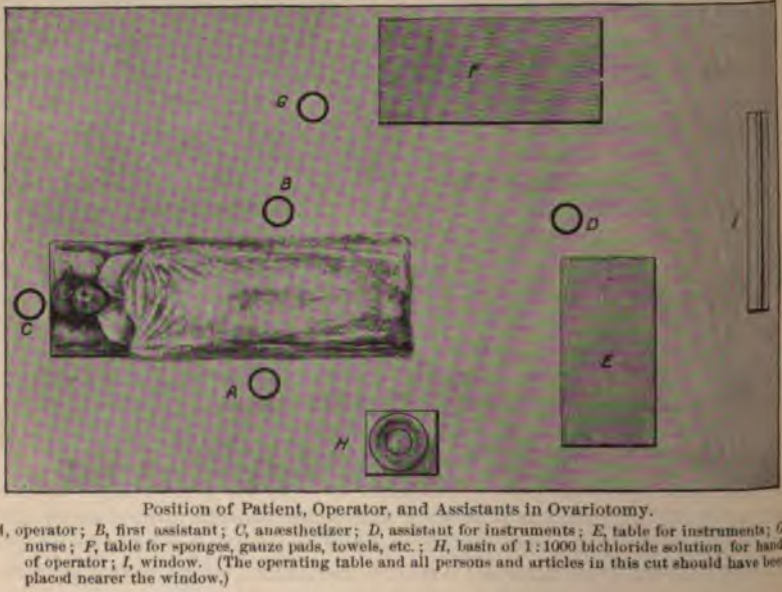
[1] For details as to aseptic preparation of sponges, etc. we refer to the section on Therapeutic Resources, p. 62.

FIG. 312.



Position of Patient, Operator, and Assistants in Ovariotomy.

A, operator; *B*, first assistant; *C*, anæsthetizer; *D*, assistant for instruments; *E*, table for instruments; *G*, nurse; *F*, table for sponges, gauze pads, towels, etc.; *H*, basin of 1:1000 bichloride solution for hands of operator; *I*, window. (The operating table and all persons and articles in this cut should have been placed nearer the window.)

instrument, sponge, etc. accidentally dropped upon the floor during the operation is not to be used again on that day unless first thoroughly scrubbed and disinfected.

Position of Patient, Operator, Assistants, etc.—The patient lies at her full length on the table if of sufficient length, or, if not, with her feet supported by a chair. The operator stands on the right hand of the patient, facing her head. The first assistant stands on the opposite side, facing the operator. The table containing the instruments, which are placed in flat porcelain or agate-ware trays covered with a 3 per cent. solution of carbolic acid, stands on the right hand of the operator at the foot of the operating table. To the right or left hand of the operator, on a small stool, stands an agate-ware basin containing a solution of 1 : 1000 bichloride, into which the operator dips his hands as often as he thinks they need cleansing during the operation. Some operators occupy a different position from the one described. The late Prof. Schroeder stood on the left side of the patient, facing her feet, and made the incision from the pubes upward toward the umbilicus; Martin sits on a low stool between the separated thighs of the patient, and operates in this position; but the majority of operators occupy the place which we have described. The patient, who has received a warm bath on the morning of the day of operation, in which she was thoroughly scrubbed, and perhaps even washed off with a 1 : 10,000 solution of bichloride, and whose bowels have been thoroughly moved for several days previously by laxatives, but by enema only on the morning of the operation, is placed upon the table, and her abdomen is thoroughly scrubbed, first with soap and then with a 1 : 2000 bichloride solution and dried. Then a solution of iodoform in ether is poured over the lower part of the abdomen, care being taken to fill the umbilical fossa with it, so as to disinfect this portion most thoroughly. The abdomen is surrounded by warm wet towels wrung out of a 1 : 1000 bichloride solution, so as to leave a square area of skin exposed. The pubes, which have been shaved, are covered with especial care. The bladder, which has been emptied either voluntarily or by catheter just before the operation, is now sounded in order to ascertain whether it has possibly been drawn up on the anterior wall of the cyst by adhesions and brought in the line of the usual incision. An avoidance of this precaution has more than once resulted in the bladder being opened under the mistaken idea that it was the peritoneum.

Incision.—The point chosen for the incision is usually midway between the umbilicus and the symphysis pubis in the median line. The operator seizes a sharp-pointed bistoury, and, carefully following the linea alba, makes an incision about two inches long down to the fascia of the recti muscles. It is not necessary to dissect step by step through the fat down to the muscle, as has formerly been recommended. Bleeding arteries are frequently met with during this first step, and should either be at once caught up and tied with catgut or compressed with artery forceps, which can be removed before the peritoneal cavity is opened, when the smaller vessels will probably have ceased bleeding. The fascia of the recti muscles is now caught up by the operator and his assistant, each with a mouse-tooth forceps, and incised between the two. If lucky, the aponeurosis of the muscles is at once discovered and carefully divided down to the supraperitoneal fat. We say "if lucky," because we know of no sure guide by which that aponeurosis can always be found at the first stroke. It has been our experience that, standing on the right side as we do, we have usually, when we failed to find it at once, gone a little too far to the left, and hence on searching toward the right we have easily discovered it. It is of advantage to make the incision through the aponeurosis rather than through the fibres of the rectus muscle, since the latter are more liable to bleed and be torn by the inevitable manipulations during the rest of the operation. After reaching the supraperitoneal fat, this is lifted up by mouse-tooth forceps and drawn gently to one side, and then will appear the glistening pink peritoneum, which should be very carefully and superficially elevated by the forceps held by the operator, and grasped at about half an inch distance by another forceps held by the assistant. Between these two the peritoneum is then very carefully nicked, having been drawn up out of the incision, so that by transmitted light the operator can see whether he has carried up intestine or omentum which may chance to be adherent to that point or have followed the lifting up of the peritoneum. Often the peritoneal cavity is opened by one nick of the knife, but quite as frequently, especially if there has been chronic peritonitis, layer after layer has to be divided with the greatest precaution, and, we confess on our part, usually with some anxiety, before finally the cavity is opened.

The older operators recommended the use of the grooved director in making the abdominal incision, dividing each layer of fat, fascia, and finally the peritoneum on the director, but we have ceased using that instrument for a number of years, finding it quite unnecessary if the precautions just described are observed. The steps and difficulties of opening the peritoneal cavity which we have just enumerated apply perhaps rather more to that operation when there is no distension of the abdominal cavity, as is usually the case when an ovarian tumor is to be removed. In the latter instance this first step of the operation is usually very much facilitated, because the distended abdominal walls are much thinner, there is generally very little fat, and the peritoneum is not thickened except when chronic peritonitis has prevailed. It usually takes scarcely a minute to open the abdominal cavity in large ovarian tumors, whereas in a difficult case of rigid, fat abdominal walls without distension of the cavity five or six minutes of careful dissection may elapse before the peritoneum is finally nicked. Any operator who has accidentally injured the intestine by hasty incision of the peritoneum will readily appreciate the necessity for the precautions which we have enumerated.

Before opening the peritoneal cavity it is well to stop all hemorrhage from the walls of the incision by tying bleeding vessels with catgut, and it is also advisable to remove all artery forceps lying in the wound which might be in the way or possibly slip into the abdominal cavity.

An error which has occurred to several experienced operators is that the peritoneum, being thickened by chronic inflammation, was mistaken for the adherent sac of the tumor, and after apparently incising the peritoneum, which presented several layers as already described, the operator proceeded to peel loose, as he thought, the adherent cyst-wall from the adjacent parietal peritoneum, not discovering his error until he had peeled loose a foot or more of the peritoneum from its attachment to the inner surface of the muscles. This mistake really ought not to occur if the operator is careful to ascertain whether he is in the peritoneal cavity or not by following up the division of each layer with his finger, and not resting satisfied that he has opened the peritoneal cavity until his finger assures him of that fact. At times the whole cyst may be so adherent to the peritoneum of the abdominal walls that it cannot be detached, and then probably the knife, preceded by the finger, will open the cavity of the cyst and speedily discover the true nature of the case. It is always wise to percuss the anterior abdominal wall before beginning the incision, and certainly before opening the peritoneum, in order to avoid injuring the intestine, which, although it does not belong there, may possibly be adherent to the anterior cyst-wall.

The danger of injuring the bladder we have already referred to, and how it can be avoided. The bladder is sometimes pushed up by an intrapelvic ovarian tumor without being adherent. Such was the case recently in an operation performed by Mundé, where the previous sounding of the bladder had been overlooked, and only a very careful dissection and extension upward of the incision and opening the peritoneal cavity there saved the bladder. The peritoneum, when thickened by chronic inflammation, is often easily stripped from its muscular attachment, and especially if the abdominal walls are very thick or rigid we have found it a useful device to pass a temporary suture through each lip of the wound, tying it and leaving the ends long, for the purpose not only of preventing this detachment of the peritoneum, but also in order to use these sutures as retractors in case of need.

Operation.—The steps of the operation are the following:

1st. Incision through abdominal walls;
2d. Tapping tumor;
3d. Removal of the sac;
4th. Securing the pedicle;
5th. Cleansing the peritoneum;
6th. Establishing drainage, if necessary;
7th. Closing abdominal wound;
8th. Applying antiseptic dressing.

As a rule, the shorter the abdominal incision the better for the after progress of the case.

Baker Brown laid down, years ago, in reference to abdominal section, this important rule: it should always be regarded originally as an explorative incision. If any condition contraindicating the removal of the sac be found to exist, it may then be closed without exposure of the patient to great danger, while if it be found advisable to enlarge it to proceed, this may be done to any necessary extent. Even large monocysts may be removed through a small incision, not longer than one inch and a half. The great dread which has always been entertained of cutting into and exposing the peritoneum lends a degree of fascination to the short incision. But at present we no longer fear to incise or expose the peritoneum, knowing that our scrupulous antiseptic precautions guard against septic infection; and when it is borne in mind that, for want of a sufficiently free incision, a tumor is often slowly and clumsily removed, bleeding vessels not detached, and an unclean peritoneum closed up in place of a clean one, it will be recognized that an operator may err in this direction as well as in the other.

No universal rule exists as to a long or a short incision, most operators being guided by the necessities of each case. The Germans usually make long incisions, the English prefer them short, and the Americans follow the plan first suggested by Baker Brown, to begin with a small incision and to enlarge it if necessary. It is not the length of the incision that is to be feared, but when unnecessary to clean and thorough operating there certainly is no use in prolonging the operation by making an opening which calls for lengthy stitching and predisposes the patient to the danger of subsequent ventral hernia.

The results of Sir Spencer Wells, as embodied in the following table, prove, however, that short incisions are greatly to be preferred to long ones:

	No. of cases.	Recoveries.	Deaths.	Mortality.
Not exceeding 6 in.,	440	337	103	23.4 per cent.
Exceeding 6 in.,	60	36	24	40 " "

It is equally worthy of note that the same surgeon operated on 17 cases by an incision of three inches, and lost 23.53 per cent., and on 203 cases by an incision of five inches, and lost 19.7 per cent.

The most rational deduction to be drawn from these facts is this: that the shorter the incision by which the sac can be removed "tuto, cito, et jucunde," the better for prognosis. The effort to remove the sac, however, through an opening so small as to involve delay, uncertainty, and inefficient manipulation gives the patient a poorer prospect for recovery than the making of a longer incision would offer.

The shining wall of the cyst, which is recognized by its pearly-white, mottled appearance, being now under the fingers and eyes of the operator, he has an opportunity of verifying his diagnosis by palpation, visual examination, and removal of fluid by a very small trocar and canula or by the needle of the hypodermic syringe. Should connection with the uterus be suspected, before proceeding farther its relations to this organ should be determined by passing the uterine sound, and rotating the uterus while two fingers are passed through the abdominal wound down to the fundus uteri.

Before this, however, the operator may be checked in his progress by discovering that he is not in contact with the cyst-wall, although the peritoneum be opened. In place of the smooth, shining wall of the cyst, he discovers a vascular membrane containing large vessels which spreads over the tumor like an apron. To one who has never seen this covering it will prove very perplexing. It consists of the peritoneal walls or roof of the broad ligaments, which have been spread out by the growing tumor and have undergone great hypertrophy. Tumors thus surrounded have, according to our experience, broad and short pedicles, and their extirpation will be very difficult unless the valuable method advised by Dr. Miner of Buffalo be adopted. It consists in cutting through the envelope of the cyst, avoiding as far as possible the opening of large vessels, introducing the fingers, and enucleating the tumor.[1] The sac which is left should then be opened, thoroughly cleansed, touched all over its oozing surface with solution of persulphate of iron, and if large tied around a drainage-tube. If the sac cannot be enucleated, as much of it with its peritoneal envelope as can be drawn out of the abdominal cavity should be removed close to the abdominal wound, and its edges sewed to the edges of the incision. The cavity after careful cleansing should be packed with iodoform gauze. Further reference to these cysts will be made later on.

Should any doubt exist in the mind of the operator whether the structure which he sees through the incision is really the cyst-wall or the peritoneum covering it, he may endeavor to pass a finger thoroughly washed in carbolized water between the cyst and peritoneum, or a steel sound may be gently swept around if it be possible. We usually employ a large (Peaslee's) sound for the purpose of detecting adhesions, which, if thin and loosely attached, may be broken by the sound as it is carried around the cyst; if thick, we are prepared to deal with them by ligature and division as they come in view during the delivery of the cyst.

Tapping.—[Before tapping it is my habit to turn the patient on the side toward the operator, whose special attention at this moment should be directed to two objects—one preventing the escape of even one drop of fluid into the peritoneal cavity; the other the avoidance, as far as possible, of the introduction of his hands or fingers into it. Turning the patient on the side greatly facilitates the second of these, and by no means increases the difficulties of the first. The assistant opposite the operator, now standing at the back of the patient, steadies her body with his right hand, while with his left he presses a soft, carbolized towel or sponge firmly against the abdominal wall just below the incision, so as to prevent ingress of fluid to the peritoneal cavity. The operator should now thoroughly cover the raw lips of the wound with carbolized vaseline or some other unctuous substance to prevent absorption of the colloid, perhaps the decomposing, purulent fluid of the sac, which is now to be tapped and withdrawn.—T. G. T.] [While no objection can be made to this practice of turning the patient on the side before and during the tapping of the cyst, it is now followed by very few operators, simply because it is not necessary. By careful compression of the abdominal walls to the cyst as the fluid escapes, by speedy traction on the cyst-wall with vulsella, so as to keep the opening in the cyst well out of the abdominal incision, by enlarging the opening in the cyst, and by protecting the lower angle of the wound by towels, no fluid can possibly enter the abdominal cavity with the patient in the dorsal position. I have not practised the change to the lateral position for years. Besides, we now no longer fear the entrance of ovarian fluid into the abdominal cavity, for we know that it is not poisonous, and that we can easily wash out what little may accidentally get in. I do not wish to be understood, however, that I would not use every precaution to prevent its entrance; but should any accidentally enter I should not consider it a great misfortune or a serious danger to recovery.—P. F. M.]

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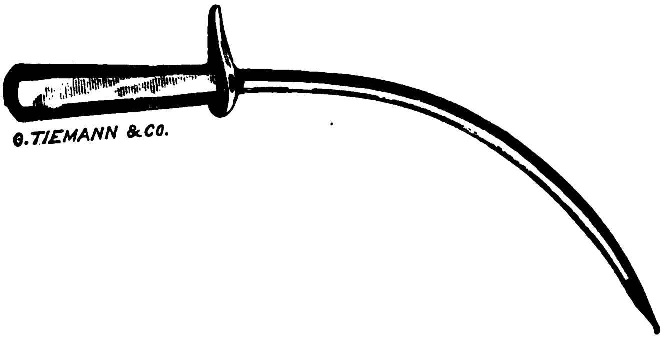
[1] We have resorted to this method a great many times, with good results, in cases which would have proved unmanageable by other means. It appears to us to be one of the most valuable of all the contributions to ovariotomy which have emanated from this country.

With a long curved trocar and canula, such as that shown in Fig. 313, the fluid of the sac is now allowed to flow away if it be not too tenacious to do so.

FIG. 313.



Emmet's Trocar and Canula for Tapping Cyst.

We have cast aside entirely, and would advise others to do so, the cumbrous attachments to trocars intended to carry off the fluid of the sac without soiling the surroundings of the patient. If a large wash-tub be placed upon the floor, and a little skill and care be displayed by the operator, no necessity for them will be found to exist. Or the fluid may be caught in basins held under the protruding cyst.

Let us suppose that the sac contents flow away easily and freely; the operator should wait until the visible portion of the sac protrudes a little through the abdominal opening; then he should fix a vulsella forceps in it and draw the opening in which rests the canula just beyond the abdominal wound. In a few minutes a second vulsella should be fixed in the sac, and very soon it will protrude decidedly. As soon as it is outside the abdomen, the canula may be with advantage withdrawn. and a free opening made into the sac by a pair of scissors, to prevent the waste of time which would attend its slow evacuation through the canula.

If one sac be emptied and another be felt, the operator may introduce the trocar into the canula, turn this obliquely, and plunge it into the remaining cyst or cysts; or he may—and this is usually safer and better—pass one or two fingers or the entire hand into the main sac and rupture the remaining ones in this way, and allow their contents to flow out. In doing this the hand should never be passed into the peritoneal cavity, and great care should be observed not to break any remaining cyst so as to let it communicate with that cavity. This manœuvre is a very important and effectual one, and withal a very safe one, since the cyst-walls protect the peritoneal cavity thoroughly. It is far safer than the plan of plunging a trocar and canula blindly about in search of cysts, and than that of passing the hand into the peritoneal cavity to find them.

While the fluid is pouring out, compression of the abdominal walls against the tumor should be made by an assistant, who places one hand on each side of the abdominal incision, and the sac should be kept from slipping into the abdomen by strong forceps made to grasp its lips if an ordinary canula be employed.

Suppose, however, that the fluid of the cyst is semi-solid colloid, that numerous very small cysts exist, or that a large amount of solid material prevents evacuation of the tumor by trocar; what then is to be done? Seizing the tumor with two large and strong vulsella at the extreme upper and lower extremities of the abdominal wound, and holding it firmly against it, the surface of the tumor between these vulsella should be cut through, and one finger, then two, and then the whole hand, introduced, breaking up as it goes little cysts, and at once evacuating their contents. When the hand has well entered the tumor a species of "conjoined manipulation," one hand on the abdomen and the other in the tumor, will serve to reveal the presence of all cysts not yet evacuated.

In this way immense tumors may be delivered without introducing the hand into the peritoneal cavity, without making a long abdominal incision, and without allowing the escape of sac-contents within the abdomen.

Removal of the Sac.—The sac, being now drawn out by the tooth-forceps, vulsella, or pincers, which have been fixed in it to prevent its escape into the abdomen, is seized by the fingers of the operator and gently drawn forth through the incision. This is the time for breaking adhesions, and this is best done, as a rule, by steady traction upon the sac. In the large majority of cases traction, steady and even powerful traction, upon the sac is the best, most rapid, and safest method of severing attachments. Of course, this must not be rash or intemperate in degree, for by that serious damage might be done; but it should be so firm and decided as to break all ordinary attachments.

Adhesions of the wall of the cyst to neighboring organs are very common, and usually more or less unsuspected. The most common adhesions are between cyst-wall and abdominal wall, omentum, large intestine, and its mesentery. Less common, fortunately, are those between long loops of small intestine, bladder, liver, diaphragm, and walls of the pelvic cavity.

If the delivery of the sac is restrained by adhesions of sufficient firmness as not to tear as the attempt is made to draw them out of the abdominal cavity, if necessary the incision should be enlarged, and in any case the adhesion fully exposed, and, if thick, tied in two places with strong catgut or silk and severed between. Thin, flat, filmy adhesions can be detached by gentle teasing with the finger-nail or pushing with a wet sponge. But, of course, no bleeding point should be left unligated. Adhesions to the intestines are by all odds the most troublesome and dangerous to ligate and detach. Occasionally the peritoneal coat of the gut is injured during the treatment or separation, and requires to be sewed by fine catgut or silk sutures. The lumen of the intestine has even been accidentally torn into on such occasions. At times it may be necessary to leave a piece of the cyst-wall attached to the organ to which the cyst was adherent; it is well, in that case, to prevent the possibility of a re-formation of the cyst by peeling off the secreting surface of the adherent piece.

Sometimes, instead of adhesions here and there, the cyst is found universally attached over the pelvis, and the operator sees cause to fear lest the removal of the whole cyst may prove impracticable. This condition of things may be dealt with in one of two ways: The operator may strip the envelopes of the sac away from it about three inches above the attached surface, and enucleate its lower segment; or if he find this impossible, or deem it to be very hazardous on account of hemorrhage, he may pass into the extremity of the sac a glass drainage-tube, tie the sac firmly around this, and, fixing both sac and tube between the lips of the abdominal wound, drain it and inject with carbolized fluid; or, as is now done most commonly, pack it with iodoform gauze.

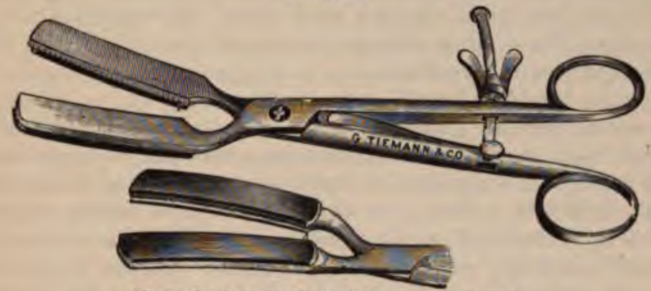
There are little manœuvres which experience will teach the operator which will greatly assist in removal of the sac from the abdomen when difficulties present themselves. One of these, which we learned of Sir Spencer Wells, consists in ignoring the attachments at the upper part of the sac, seizing its lowest, inner portion, pulling this out through its mouth, and thus completely inverting it. Another consists in ligating the tumor, when much solid matter exists at its lower extremity, before complete emptying of it, turning it over, and delivering the pelvic extremity first. A third plan is applicable when the upper portion of the tumor is fluid and that below the umbilicus solid, and consists in passing the long trocar through the solid portion obliquely upward, emptying the upper sac, pulling this down and out first, and then dragging out the solid portion near the pelvis. By adopting these methods in suitable cases it is surprising to see through how short an incision a colossal and semi-solid tumor may be extracted. [Some years ago I removed one in the Woman's Hospital weighing over sixty pounds through an opening of less than five inches.—T. G. T.]

The tumor, being freed from attachments, is now drawn forth and the pedicle seized in the fingers. To prevent the fluid from soiling the instruments, and perhaps entering the abdominal cavity, the sac is wrapped in a wet aseptic towel, and, if necessary, the towels surrounding the incision replaced by clean ones. We now are in the habit of compressing the pedicle with the clamp shown in Fig. 314, and cutting off the tumor, in order to have more room for the application of the ligature to the pedicle.

Securing the Pedicle.—Formerly there were several methods in use of securing the pedicle, the favorite one being the permanent clamp, left on until the stump sloughed away; the next, ligation and transfixion with pins in the abdominal incision; third, ligation and dropping into the abdominal cavity; fourth, temporary clamp and actual cautery. Of these methods, all have been abandoned except two—ligation and dropping, and temporary clamp, ligation, searing off portion above clamp with the Paquelin cautery, and dropping.

According to Dr. Peaslee, the method of ligating the pedicle, cutting both ligature and pedicle as short as possible, and returning them to the abdomen and closing the abdominal incision, was first popularized by Dr. Tyler Smith of London, and as long ago as 1829 by Dr. Rogers of this city. Great objection was made to this method for many years, the two chief reasons being the danger of slipping of the ligature and secondary hemorrhage, and the sloughing of the stump above the ligature. Besides, the leaving of a silk ligature in the abdominal cavity was thought to be a dangerous proceeding. Hence the apparently more safe method of fixing the clamped pedicle in the abdominal wound, or of keeping it there after the ligation by means of transfixion with long needles, was formerly universally adopted. Within the last ten years, however, experience has shown us that it is perfectly safe to ligate the pedicle and drop it into the abdominal cavity, so long as we are careful to tie the ligature so tightly that no subsequent hemorrhage can occur. At the present day no other method than the dropping of the pedicle is employed, except in the rare instances where the pedicle is so short that its constricting ligature encroaches upon the body of the uterus, when it may be thought best to protect against possible secondary bleeding by uniting the edges of the peritoneal covering of the pedicle by interrupted silk or catgut sutures. The objection to the dropping of the pedicle thus ligated, that the portion above the ligature would become gangrenous, has been shown to be erroneous, since the end of the pedicle either becomes attached to some neighboring organ, and is thereby nourished, or else an anastomosis takes place between the vessels of the peritoneum covering the pedicle above and below the ligature. Occasionally the silk ligature produces more or less trouble, keeping open a sinus communicating with the abdominal skin, which often is not closed until the ligature cuts through and is expelled. The ligature usually employed is strong braided or twisted silk, but some operators prefer the strongest catgut which can be found in the market. The objection to catgut, in our opinion, is the difficulty of drawing it to so tight a knot that slipping or loosening is actually impossible.

Fig. 314.

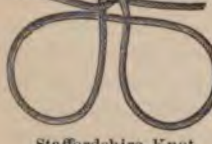


Clamp for Searing the Pedicle in Ovariotomy.

Still, we are of the impression that in pedicles which are not unusually thick or fleshy catgut offers many advantages over silk, since it will retain its constricting force for at least a week, which is much longer than is necessary, and will certainly never give trouble in the future. It is very unusual for us to meet with sinuses dependent upon efforts of the silk ligature to escape, particularly when the pedicle has been dropped and the abdominal wound entirely closed. Only when a drainage-tube has been used or very many silk ligatures have been applied do we fear trouble from a subsequent discharge of the ligature. Metallic ligatures of silver wire are no longer employed in securing the pedicle of an ovarian tumor.

There are different forms of knots in use by various operators for ligation of the pedicle. The simplest form is to pass a single thick silk ligature through the centre of the pedicle about half an inch below the point at which it is intended to sever the pedicle, and to tie first one half by a tight double knot, and then carry both ligatures around the other half and firmly tie again. For slender pedicles this variety of knot would probably answer very well. Another form is to pass a double silk ligature through the centre of the pedicle, cut the loop on the opposite side, and tie each part separately, carrying one of the ligatures entirely around the whole pedicle, and tying again in order to prevent possible hemorrhage from the point of puncture. This is the usual old form of pedicle ligature by transfixion. The ligature which we most frequently use is the one which has been popularized, although not invented, by Mr. Lawson Tait, and which is known by the name of the Staffordshire knot. The long straight needle with an eye in its point which is used by us for transfixion of the ovarian pedicle is threaded with a stout silk ligature, so as to form a loop on one side, with both ends free on the other side of the eye. The pedicle is transfixed in the centre, the loop drawn out, and the needle removed. The operator takes care that each free strand of the ligature corresponds to its respective side of the loop. The loop is then brought over the pedicle toward the operator, and *one* strand is passed through the loop, the other remaining outside. The strand within the loop is then drawn tight, the other strand being held gently, so as to prevent its being pulled through the pedicle. As soon as the former strand is tightly drawn the outside strand is also drawn as tightly as possible. In this way the pedicle is completely compressed, and both strands are then firmly tied by an ordinary double knot. This is the real Staffordshire knot. Tait and many of his followers consider this knot absolutely safe, and rely upon it implicitly for compression of the pedicle. We have thought it wise, basing upon a fatal case of slipping after this form of ligation which occurred in the practice of Dr. T. A. Emmet (by private information), to carry the ligature once more around the pedicle in the same groove and to fortify the Staffordshire knot by an additional double knot of the ordinary type on the opposite side. This extra amount of silk adds nothing to the danger of the operation, and may prevent possible slipping

FIG. 315.



Staffordshire Knot.

of the ligature and secondary hemorrhage. Before applying this ligature, for convenience' sake, if the tumor is very large, we compress the pedicle with the clamp shown in Fig. 314 and remove the tumor above. This enables us to carry the loop of the Staffordshire knot easily around the handles of the clamp.

[I have almost since the beginning of my career as a laparotomist adopted the plan of compressing the pedicle by means of the clamp shown in the accompanying cut, which is merely an ordinary hemorrhoid clamp with a protecting surface of hard rubber; cutting off the tumor, then ligating the pedicle in the double manner just described, and then searing off the portion of the pedicle situated above the clamp with the Paquelin thermo-cautery at red heat. My object in doing this is partly to guard against any possible secondary hemorrhage, which I really do not believe could occur if the ligature is properly tied, and partly to prevent adhesion of the fresh pedicle to neighboring organs. After removal of the clamp and inspection of the pedicle to see that it is thoroughly seared, the ligature is cut short and the pedicle dropped. I have never had occasion to deplore using this double method, which first occurred to me after reading the splendid results achieved by Keith by means of the cautery alone.—P. F. M.]

The division of the pedicle by the cautery only, although eminently successful in the hands of Dr. Thomas Keith of Edinburgh, who reports 70 successive ovariotomies treated in this way without a death, has still not seemed to us sufficiently secure to warrant our employing it. We have preferred, as stated, either to use the ligature alone or the ligature and cautery together.

The dangers which may possibly ensue from the pedicle after ligation are the slipping of the ligature, with subsequent hemorrhage, and, if not detected and rapidly arrested, death; gangrene of the stump, which we have stated does not occur, although theoretically it might be feared; and finally the attachment of the stump to intestines or the neighboring peritoneum. The latter accident undoubtedly occurs more frequently than is desirable, and the local pain so often complained of in the region of the pedicle after the removal of ovarian tumors or diseased ovaries and tubes is undoubtedly due to some such complication. Unfortunately, nothing can be done for it except the reopening of the abdominal cavity and the detachment of the adhesions. Occasionally even cysts of the broad ligament may be drawn out so far as to enable the operator to form a pedicle out of the combined layers of the broad ligament, but this is the exception, and enucleation of such cysts the rule.

Before proceeding to the next step of the operation, the remaining ovary should always be carefully examined as to the existence of disease. During the removal of a large ovarian cyst it is very common to find very small cysts disseminated throughout the other ovary. If any of these have obtained considerable size, it is advisable that the organ should be removed. But if they be too small to call for this course, the matter may be compromised by puncturing them with a needle. Pippingskoeld[1] of Helsingfors, Finland, advises that the small cysts should be punctured and their walls rapidly but efficiently cauterized with a pointed actual cautery. He declares that he has resorted to this plan in many cases, and with uniformly good results.

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[1] *Am. Journ. Obstetrics*, April, 1880.

The late Prof. Schroeder was, we believe, the first to recommend and practise the conservative method in cases of small cysts of the second ovary. He excised the walls of the cyst, scraped its cavity gently with the curette, and united the edges of the cyst by fine interrupted catgut sutures, and returned the organ to the abdominal cavity. We have repeatedly adopted this procedure, and, while we have never had occasion to see the ovary thus treated again, have had no reason to regret its performance. Many an ovary can thus be saved which, on the general principle that a cystic ovary which is liable to become an ovarian tumor should always be removed, would have been sacrificed. The possibility of future impregnation is certainly preserved by this conservative treatment.

Cleansing the Peritoneum.—The sac having been removed and hemorrhage checked, all fluids contained in the peritoneal cavity should be carefully removed by soft sponges squeezed out of warm carbolized water. Not only the intestines and abdominal walls, but especially the pelvic cavity, should be completely and thoroughly cleansed. This is a point of great importance, and may decide the issue of the case. Every particle of fluid left may undergo decomposition, and expose to the great dangers of septicæmia and peritonitis.

We have retained the above directions from our last edition, because they are substantially correct and should be followed as nearly as possible in every case; but with the careful antisepsis which is now carried out in every surgical case, and, as we have stated, particularly in ovariotomies, it is of much less importance to remove every particle of cyst-fluid, blood, or serum from the abdominal cavity than was the case in former days. Our present rule is to sponge out the pelvic and abdominal cavity but very slightly and gently with sponges attached to holders.

If we are in doubt as to whether any cyst-fluid, pus, or blood-coagula are still left in the abdominal cavity, we prefer to wash out the latter with warm boiled water at a temperature of 100°, or Thiersch's solution at the same temperature, poured into the abdominal cavity from a pitcher until the fluid escapes entirely clean. The presence of a few fresh coagula or a slight amount of cyst-fluid, even when mixed with a few shreds of plastic lymph, appears to be of no special consequence, since we have closed many an abdominal incision under such circumstances, and have never seen the slightest sign of septic infection or inflammatory reaction ensue.

Establishing Drainage.—Definition.—Drainage means the introduction into the abdominal cavity after abdominal section of a tube or some other substance, by means of which a discharge of fluid from the cavity is rendered possible so long as the drain is left in place.

Indication.—The indication for such drainage is either the probability that a greater or lesser amount of bloody or serous secretion will take place within the peritoneal cavity after the operation, or that certain noxious substances, such as cyst-fluid, pus, or blood, have been unavoidably left in that cavity. A further indication might be the fear that a secondary hemorrhage might occur, the diagnosis of which would be facilitated by the presence of a drainage-tube. At present we usually prefer drainage through the abdominal incision. A few operators, chief among whom is Martin of Berlin, prefer the vaginal vault, and pass a rubber drainage-tube from Douglas's pouch into the vagina, mostly in cases of complete removal of the uterus and appendages for fibroids. The late Dr. J. Marion Sims advocated vaginal drainage after the removal of ovarian tumors as a means of preventing septic infection through the accumulation of serum in Douglas's pouch. His theory, however, proved to be erroneous, since such an accumulation of serum in Douglas's pouch, if the operation has been performed with proper antisepsis, is of no consequence whatever. As nearly all his patients died upon whom this method was practised, it was soon abandoned.

There is no one point in the operation of ovariotomy, or indeed in the whole domain of abdominal surgery, on which there is a greater diversity of opinion than upon the necessity, the indications for, and the utility of drainage. Nearly all operators agree that whenever there is the probability of any serous or bloody discharge after the operation, or when purulent cystic or hemorrhagic effusions have been accidentally left behind, a drainage-tube is indicated. This would apply chiefly to cases where large raw surfaces have been left in the abdominal cavity, as after the enucleation of adherent ovaries and tubes, the separation of numerous adhesions between an ovarian cyst and neighboring organs, the escape of pus into the abdominal cavity during the removal of an abscess of the ovary or tube, and when the cyst had ruptured before the operation and chronic peritonitis exists. The English and the majority of the American operators employ drainage in such cases, and follow the rule, "Whenever in doubt, drain." The German operators, on the other hand, have discarded drainage as much as possible, relying upon their thorough observation of antiseptic precautions, upon the careful cleansing and washing out of the abdominal cavity, and the perfect adaptation of the lips of the wound. They feel that with a perfectly clean, aseptic abdominal cavity a small effusion of serum or blood into it subsequent to the closure of the wound is of no consequence. [And I, for my part, feel disposed to agree with them. I read before the American Gynecological Society in 1887 (see *Transactions* for that year) a paper on "Drainage after Laparotomy," in which I advocated the avoidance of drainage whenever possible under the careful observance of the rules just stated as followed by the German surgeons, and I have since then had repeated opportunity to confirm my opinion there expressed. From my experience I am compelled to believe that a drainage-tube; when the abdominal cavity has been carefully cleansed and all possibility of secondary hemorrhage is excluded, is of no use whatever, and may be even a source of danger through the local irritation which it produces on the peritoneum and the adjacent intestines, through its interference with the proper peristaltic movements of the gut, and through possible reflex gastric disturbance which I think I have observed in two instances. While I would, therefore, not hesitate to employ a drainage-tube when absolutely forced to do so, I would always feel much safer as regards the recovery of my patient if I could conscientiously omit the drainage and close the abdominal incision.—P. F. M.] Bantock is one of the most active adherents of the drainage-tube, using it in probably four-fifths of his cases. Tait likewise very frequently employs it, and the results of both these gentlemen are so brilliant that it would almost seem a sacrilege to question the utility of the method. Still, Olshausen very seldom if ever uses drainage, and in the last edition of his book on the *Diseases of the Ovaries* says that since July, 1882, he has not drained in any case of completed or uncompleted ovariotomy, although many complicated and unclean cases occurred to him in which frequently the condition of the patient prevented careful toilet of the peritoneum. His last two patients treated with drainage died of septicæmia. Since then, of 124 ovariotomies, not one died of septic infection. Even in cases of enucleation of large subserous and intraligamentous tumors, from the bed of which oozing is more than probable, Olshausen advises against drainage, preferring to stop oozing by pressure, and after thoroughly cleansing the cavity by sponges dipped in carbolized water to leave it open and to completely close the abdominal wound. His objections to drainage are secondary septic infection, tedious suppuration, and an abdominal fistula which may persist for years. Dr. Goodell of Philadelphia is by no means a firm believer in the drainage-tube, but thinks it of value in detecting a possible secondary hemorrhage. Injections into the abdominal cavity through a drainage-tube should under no circumstances be employed; they are useless, unnecessary, and dangerous, because they are liable to break up fresh adhesions and thereby distribute possible septic matter through the, as yet, uninfected peritoneal cavity.

Before closing the question as to the indications for abdominal drainage we wish to place ourselves on record as in favor of the method under certain rather rare circumstances, but as opposed to it whenever the probability is that there will be no discharge into the peritoneal cavity which would be productive of injury. With a few exceptions we have found that the amount of bloody serum withdrawn from the drainage-tube during the first twenty-four hours after the operation was so slight that we can hardly imagine that its retention would have produced the slightest evil effects. Hence we could not but feel that the drainage-tube was entirely unnecessary. We must leave it to the individual judgment of each operator as to whether he thinks it best to employ drainage in any given case after he has considered the remarks made in the preceding lines.

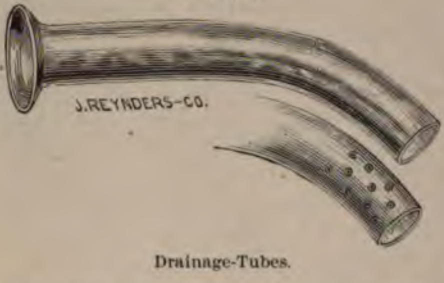
Method of Drainage.—The only two methods of drainage which we now employ are the following: 1st. By means of glass tubes of different sizes and lengths, slightly curved so as to conform to the posterior curve of the uterus. These are introduced, after the abdominal cavity has been cleansed by irrigation and careful sponging, into Douglas's pouch, and the lumen is filled by a loose plug of iodoform gauze. A tube of such length should be chosen that it touches the bottom of Douglas's pouch without protruding far above the abdominal skin. It is of course important that no injurious pressure should be exerted against Douglas's pouch. This tube is introduced just before the abdominal incision is closed and before the dressings are applied. Such fluid as may be present in the tube is soaked up by a syringe to which a long rubber tube is attached. We are in the habit of leaving two sutures free in the abdominal wall at the spot where the tube rests—that is, in the lower angle of the wound. These sutures are prevented from slipping by means of clamped shot at each end. Their object is to enable a rapid and complete closure of the entire depth of the abdominal wound when the tube is removed. In this way the formation of a sinus and possible subsequent ventral hernia is thought to be to some extent prevented. Every three hours, at the longest, after the patient has been returned to her bed the packing of the tube is removed, and such fluid as may be contained in it drawn up with the syringe. As soon as this fluid loses its clear bloody character and becomes serous and diminishes in quantity down to from one to two drachms, which in our experience usually takes place within twenty-four hours after the operation, the tube should be removed and the wound closed by the sutures left ready for that purpose. We can remember but two or three instances in which so much discharge of bloody serum took place after an ovariotomy, with many flat adhesions which could not be ligated, that we could see the real utility of the drainage-tube. In by far the majority of cases in which it was used the amount of bloody serum secreted within twenty-four hours was so slight that we do not believe it would have in any way injured the woman if it had been allowed to remain in the cavity of the peritoneum subject to the absorbent powers of that membrane.

Double drainage-tubes made of glass or hard rubber, which have been introduced both by Thomas and by H. Marion Sims with the object of pouring a steady stream of water through the tube, and thus washing and thoroughly irrigating the abdominal cavity, have, we think, now been almost entirely discarded, for the simple reason that they have been found unnecessary and are too complicated for complete cleanliness.

2d. *Iodoform gauze* has been recommended as a means of drainage, chiefly by Mikulicz of Vienna, who packed large bleeding or absorbing cavities in the abdomen with it and carried the end out of the abdominal wound. The gauze thus applied acted both as a hemostatic and a capillary drain. Its deodorant quality prevented it from becoming offensive, and it could thus be left in place for a period varying from three days to a week, when it was gently withdrawn, and if necessary replaced by a new packing. The results obtained by this method of hemostasis and drainage in cases of intraligamentous cysts and ruptured pelvic hematomas have been simply marvellous.

Dangers.—We have already referred to the dangers which may result from the practice of drainage, and will merely recapitulate that peritoneal irritation, interference with the peristaltic action of the intestines, and therefore free evacuation of the bowels, reflex gastric disturbance, and finally the introduction of septic infection, are the chief objections to the use of the drainage-tube. Some operators employ drainage-tubes with numerous small openings in the shaft of the tube, and these generally have complained of incarceration of portions of omentum in these openings. For this reason we do not employ this form of drainage-tube. (See Fig. 316.) The length of time which a drainage-tube should be left in the abdominal cavity depends entirely upon the amount and character of the secretion drawn from the tube at the given intervals. We have seldom found it necessary to leave a drainage-tube more than forty-eight hours; recently, indeed, twenty-four hours has usually satisfied us that the drainage-tube had fulfilled its purpose. In former times the tube was often left in one, two, and even four weeks, but we have seen very few such cases.

FIG. 316.

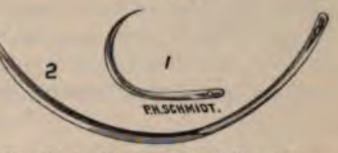

J.REYNDERS-CO.

Drainage-Tubes.

Closing the Wound.—The pedicle having been dropped, the peritoneal cavity thoroughly cleansed by very gentle sponging,, and, if thought necessary, by irrigation with boiled water or Thiersch's solution, the next step is to close the abdominal incision. The sutures employed for this purpose may be either silver wire, silk, silkworm gut, or catgut. Some operators employ silver wire exclusively, others silk and silkworm gut for the deep sutures and catgut for the peritoneum and successive layers of fascia, and others again use catgut entirely. The latter are probably in the minority. We have employed silver wire extensively, and think highly of it. We also believe that silk is an excellent suture, and, if properly prepared, open to no objections; but of recent years we have preferred the silkworm gut because it is finer, makes a smaller stitch-hole, and is less liable to cause abscess in the abdominal walls; and our practice is, if the incision is short, to use only sutures which enclose the entire abdominal wall on either side, inserting them at the upper part of the left side of the wound, passing them entirely through the abdominal wall, including the peritoneum, and reinserting them at the corresponding point on the other side. If the incision is long and the abdominal walls much relaxed, we first insert the deep sutures as already described; all of these being in position, we secure their ends by artery-forceps to prevent their being accidentally withdrawn, and then sew the peritoneum together by a running and interlooped catgut suture. Sometimes we have thought it well to tie this suture in tiers upward until the subcutaneous fat was reached. The objection to this procedure is the prolongation of the operation. Finally, the abdominal stitches are securely tied. During this whole procedure the wound is kept bathed in a 1 : 3000 solution of bichloride: that is to say, after the peritoneal cavity has been closed, for we need hardly remark that no bichloride solution, no matter how weak, is allowed to enter the peritoneal cavity. There are different methods of closing the abdominal wound, peculiar to as many different operators.

We cannot, however, enter into the details of these methods, believing that the one which we have described answers every practical purpose. As many sutures should be introduced as are necessary to bring the edges of the wound into complete apposition; if necessary, superficial stitches of catgut being added for this purpose. The needles which we use are about three inches long, sharp pointed, and with cutting edges, curved nearly to a semicircle; they are known as Schroeder's needles. We have found them the most convenient for the abdominal suture. Of course, Peaslee's eye-pointed needle may be employed for the same purpose, and Hagedorn's needle, as well as others, will answer; but we would advise in any case the employment of a needle which is long, strong, and sharp enough to easily penetrate the abdominal wall, and allow of its being carried through even very rigid parietes without danger of its being broken.

FIG. 317.



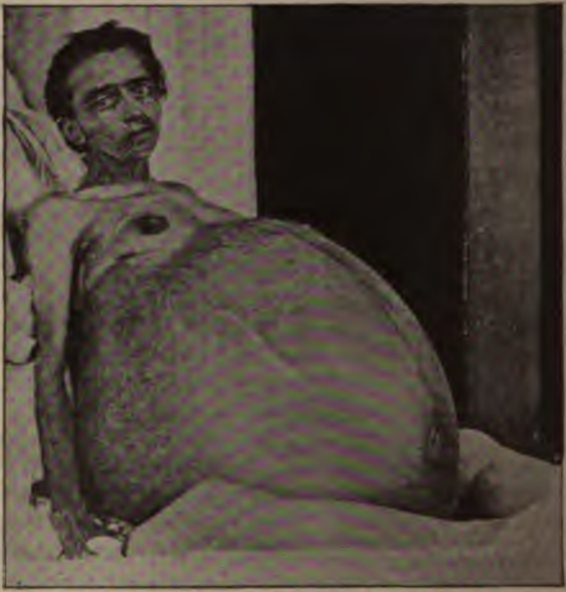
1. Needle for Vesico-vaginal Fistula Operation. 2. Needle for Primary Perineorrhaphy, or abdominal suture after laparotomy.

The last stitch having been introduced, all the sutures are carefully tied, and the abdominal wall is cleansed with a 1 : 3000 bichloride solution and dried; a strip of rubber protective is placed over the incision, over this a pad of iodoform gauze, over this another pad of bichloride gauze, then a layer of absorbent cotton. A covering of rubber tissue and a light binder are carefully adjusted with safety-pins, so as to be neither too tight nor so loose as to permit traction on the edges of the incision. If thought best, the dressing may be secured by broad strips of adhesive plaster. The patient is then washed, dried, and, when she has recovered from the effects of the anæsthetic, conveyed to her bed.

After-Treatment.—One of the most essential features for the successful issue of the case is the attendance of a careful and sensible trained nurse, who is sufficiently intelligent to know when the directions given by the surgeon are to be continued or when they should be temporarily suspended until he himself can change them in accordance with the circumstances. We make this remark advisedly, because we have seen nurses who, the administration of cracked ice in small quantities having been ordered to allay nausea and vomiting, continued to give the ice *ad libitum*, although the patient persisted in vomiting the ice in the form of water as soon as time had been given for it to melt. Obviously, the continuance of the administration of ice as a check for the vomiting was an absurdity, since it failed to effect its purpose, and something else should have been substituted or the attendant at once summoned to the case.

No greater change in the treatment of operations of this kind can possibly be imagined than has taken place during the last ten or fifteen years. Even at the time of the publication of the last edition of this work the routine treatment after an ovariotomy was to keep the patient under the influence of an opiate sufficient to relieve pain, with bowels constipated by the same means, for a week or longer, and in case of the symptoms of peritonitis supervening the administration of the opium was to be increased. All this has now changed so completely that, instead of giving opium after an ovariotomy, it is the very last drug that we should now employ. We know of a case operated upon by a celebrated English surgeon where the fatal result from peritonitis was ascribed by the operator to one or two hypodermic injections of morphine given to the patient by his assistant and her husband, also a physician, she having been for some time addicted to the morphine habit. While this may be rather an extreme illustration, still, we are now so convinced that opium is not only unnecessary, but injurious, after an abdominal section that we administer it only under the strongest possible pressure, when no other means will control the pain from which such patients occasionally, even at the present day, do suffer. Instead of keeping the bowels constipated, one of our first thoughts is within twenty-four to forty-eight hours to produce an alvine evacuation: and we feel that when this has been accomplished the recovery of our patient is two-thirds assured. This change in our views is due chiefly to the teachings of Lawson Tait, who, however, was by no means the discoverer of this method, since Seyfert of Prague recommended it as long ago as 1859 in the incipient stages of puerperal septicæmia. The idea of thus early starting up the intestinal secretions was that by thus evacuating the bowels any tendency to septic infection would be averted. However this may be, it is undoubted, and at present a matter of every-day experience, that a rise of temperature with more or less tympanites, preceded or not by a chill, is immediately con-

FIG. 318.



Ovarian Tumor weighing 149 pounds, operated on by C. K. Briddon of New York. Death.[1]

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[1] *New York Medical Journal*, Feb. 8, 1890.

trolled by one or more copious evacuations from the bowels, and we have seen many a case of apparently incipient peritonitis aborted in the same manner.

To return to the regular after-treatment. The patient having been placed in her bed, which has been previously warmed, is left perfectly quiet until she has entirely recovered from the effects of the anæsthetic, being of course watched by the nurse and attendants. Should vomiting supervene, which is not at all uncommon as a result of the anæsthetic, small pieces of cracked ice or tablets of oxalate of cerium, three grains each, every half hour, should be administered, and no food whatever is given for twenty-four hours. Stimulants are to be administered only if the weak condition of the patient seems to warrant them, dry champagne, iced brandy or whiskey being those to be chosen. When the vomiting has ceased, which in favorable cases is usually to be expected within twenty-four hours, kumyss or matzoon may be given in tablespoonful doses every hour or two hours, according to the condition of the patient's stomach, and this quantity is to be gradually increased day by day with the addition or substitution of milk, raw or boiled, and after the fourth or fifth day beef-tea in moderate quantities. If the patient can empty her bladder herself, she should be allowed to do so; if not, she should be catheterized every six hours, care being taken to avoid the introduction of vaginal secretion into the bladder, which might produce a catarrhal cystitis. The temperature is to be taken every three hours, usually in the axilla, or, if the patient's stomach is not irritable, in the mouth; the pulse and respiration likewise; and all to be recorded on a chart specially prepared for the purpose. So also about the amount of food taken, the action of the bladder and bowels, and other remarks to be recorded. Ordinarily, in cases that run the usual course, the temperature should not exceed at any time 99° to 100° F., nor the pulse 80 to 90, nor the respiration 18 to 24. Should the temperature run above 100°, and even touch 101°, and should in addition tympanites appear, the indication for the speedy administration of laxatives is present. We are in the habit of giving one-tenth grain doses of calomel by the mouth in the shape of granules or tablets, one every half hour until from fifteen to twenty have been taken, and immediately after the last one we begin with the administration of Rochelle salts in teaspoonful doses, dissolved in two ounces of hot water, every half hour until from four to six have been given. If the patient should vomit either the calomel, which is unlikely, or the salts, we wait a few hours and recommence the series. Usually this treatment will result in a series of fecal evacuations, with a complete subsidence of the tympanites and of the febrile symptoms. Should these laxatives prove ineffectual and the tympanites increase, the administration of a high enema containing one ounce of castor oil, one-half ounce of turpentine, to one pint of peppermint-water, should be ordered; and if this prove ineffectual within two or three hours it may be repeated, with the addition of an infusion of ox-gall instead of the peppermint-water. It is seldom that more than the remedies just recommended is required for the production of as many alvine evacuations as is thought necessary. In favorable cases usually even calomel may be dispensed with, and the Rochelle salts alone will accomplish the object. After the bowels have been thoroughly evacuated they should be kept open once a day at least by means of enemata or mild doses of salts. The dressing need not be looked at during the first week, unless either pain or persistent elevation of temperature leads to the supposition that there may be something wrong with the stitches, possibly the formation of abscesses in the abdominal wall. In case the latter is apparent, some of the stitches may be removed: usually they are not removed until after the end of the first week. The patient is allowed to turn on her side from the very beginning, aided of course by the nurse if necessary, and should be encouraged as much as possible at every visit. In addition to the use of laxatives and enemas to operate upon the bowels, persistent rise of temperature may call for other antipyretic measures, among which may be mentioned ten- to fifteen-grain doses of phenacetin or antipyrin, or five-grain doses of antifebrin, and the use of the ice-bag or ice-water coil on the abdomen. Indeed, we are in the habit of employing the ice-bag on the abdomen after the majority of our abdominal sections, not so much because we fear peritonitis, as because the patients seem to be more comfortable and to feel less pain when the ice-bag is employed. If the stomach should be very irritable, and, as is liable to be the case during the first few days after the operation, resist all medicinal efforts, even sinapisms over the hypogastrium, to quiet it, rectal medication may be necessary until the gastric irritation is relieved. Rectal alimentation should consist in the injection of beef extracts (Leube's or Rudisch's) in two-ounce doses every two to three hours, together with a certain amount of brandy or whiskey, one-half to one ounce if necessary. We have kept patients alive in this way, we are convinced, for at least a week until their stomachs were able to retain food.

Occasionally, after a very severe operation, the pulse runs quite high for several days, up to 120–140 beats in a minute, but the temperature does not correspond; and this difference should be a favorable symptom to us, because the rapid pulse in such cases is usually due to the anæmia or to the reaction from the shock of the operation. A high temperature and a low pulse, however, is far more serious, since it usually indicates a low form of septic peritonitis. The older books nearly all give charts indicating the temperature and pulse during the first week after an ovariotomy, just as though there was any regularity in either after that operation. We will but say that an ovariotomy progressing to easy and rapid recovery should nowadays have no rise of temperature or pulse whatever; further, that any increase of pulse or temperature usually means *something*, the exact nature of which should be ascertained as rapidly and thoroughly as possible. The rise may mean septic infection, peritonitis, or it may mean merely some trifling mental excitement or physical disturbance, such as constipation or tympanites. It is the place of the attending surgeon to inquire into and discover the cause of the elevation of pulse and temperature, and it will usually not be a difficult matter for the experienced practitioner to decide where the cause lies and what is the remedy. No precise chart, therefore, of either temperature or pulse can be given as indicative of one thing or another in the course of the after-treatment of an ovariotomy.

The stitches are usually removed, under proper antiseptic precautions, between the seventh and the tenth days. The patient may be allowed to sit up in bed about the fourteenth day, out of bed probably about the sixteenth, and may be discharged, if everything goes well and the wound is thoroughly healed, about the eighteenth to the twenty-first day. Some women have been thought well enough to be sent home as early as the fourteenth day. The usual time is from three to four weeks. The abdominal walls should always be well supported, especially after the woman is allowed to sit up or walk about, by a carefully adjusted supporter, which she should be informed it will be necessary for her to wear for at least one or two years—the longer, the longer the incision.

Evils after the Operation.—The two great dangers to be feared after an ovariotomy are septicæmia and peritonitis. Undoubtedly the majority of cases that die at the present day in consequence of an abdominal section succumb to septicæmia. How such an infection occurs, in view of the careful antisepsis which is or should be carried out with each such operation is a mystery, and still such cases do occur. In some way septic germs have crept into the abdominal cavity, and in course of time make their presence felt. With the exception of those cases where the rise of temperature and pulse is due to intestinal distension and to a reaction from the operation, we are safe to consider any rise of temperature after an ovariotomy to be due to septic peritonitis or infection, and our first move will be to combat the danger by producing a copious evacuation from the intestines, and by reducing the temperature by antipyretics such as already mentioned, and by the use of the ice-bag or ice-coil to the abdomen. In the last edition of this work the reduction of temperature in septicæmia by means of ice-water applications, chiefly to be given on a cot prepared for that purpose—the so-called Kibbee cot, after its inventor—was highly recommended. We have since entirely abandoned this method, having found it altogether too severe and mostly unnecessary, since we found ourselves able in the first place to forestall the occurrence of septic infection by the more careful employment of antiseptic measures, and in the second place to counteract it when it had actually occurred by the means described in this section. Briefly, the production of copious intestinal evacuations, the use of the cold-water coil or ice-bag to the abdomen, and the reduction as required of temperature by the medicinal antipyretics (antipyrin, antifebrin, phenacetin), will at the present day enable us to overcome any case of septicæmia after a laparotomy which is indeed amenable to treatment. In very rare instances, where retention of septic material in the peritoneal cavity appears to be the cause of the sepsis, the reopening of the wound, breaking down adhesions, and thorough irrigation of the septic cavity is of course the only proper treatment. As regards the peritonitis, its presence will be usually detected by the abdominal pain of which the patient complains and by the distension of the intestines. Contrary to the practice formerly advocated, of constipating by means of opium, which answered very well in cases of peritonitis independent of an operation, we now feel that the instigation of peristalsis, and therefore the prevention of intestinal adhesions, by means of early catharsis, in the manner already indicated, is one of our greatest safeguards against a fatal development of this disease. The ice-coil to the abdomen, preceded perhaps by turpentine stupes, the use of antipyretics, and, if necessary to relieve distension, the turpentine, ox-gall, and peppermint-water enemata already described, are among our most valuable remedies for this disease. In our experience a case of peritonitis after ovariotomy seldom runs a long course; it is either terminated speedily by a favorable issue or it runs to an equally rapid fatal result. Peritonitis arising after the first four or five days is usually of a septic character, and the question then arises whether it is not a good plan to reopen the cavity, separate adhesions, evacuate the septic fluids if they are found, and thus remove the cause of the sepsis. This is still more or less an open question, and must be decided on the merits of each individual case.

As a rule, our ovariotomies are either convalescent by the fifth or sixth day, and practically beyond danger, or they present complications which necessitate some subsequent operation, such as the opening of sinuses or the removal of ligatures which are endeavoring to force their way to the surface. It is very rare at present for us to meet with a case of ovariotomy in which the question of perfect recovery is left unsettled beyond the end of the first week.

Irremovable Cysts.—Occasionally an ovarian cyst is found to be so firmly adherent to the walls of the pelvic cavity, to the intestines, and parietal peritoneum that its complete or even partial removal proves to be absolutely impossible, for to attempt to peel out such a tumor would inevitably result in the production of hemorrhage so profuse that it could not be arrested by any means at our immediate disposal, or by injury of vital organs, such as intestines, which we would be unable to repair. We have already cautioned against the possibility of mistaking the parietal peritoneum for the adherent wall of such a cyst. Usually the abdominal incision will find the walls of the belly œdematous, thickened, and more dense than is natural, and on seeking to open what appears to be the thickened peritoneum the cyst-cavity will be entered. Our practice is in such cases, after emptying the contents of the cyst, if necessary, with aid of the fingers, to sew the cyst-wall and the abdominal walls together by means of interrupted catgut sutures, and after a thorough irrigation of the cyst-cavity to pack it fairly tightly with iodoform gauze, which can be left in for several days or even a week if no rise of temperature supervenes. The patient is otherwise treated precisely as after an ordinary ovariotomy. After removal of the gauze the cavity is irrigated with Thiersch's solution and repacked; and this treatment is repeated every four or five days until gradually the cyst-cavity shrinks and fills up by granulations, so as to eventually become obliterated. This process may occupy several weeks, indeed several months, but the usual result of these operations is an ultimate complete recovery. A few operators have advised opening and evacuating the sac, then forcing a dressing-forceps carrying a large rubber drainage-tube through the bottom of the cyst into the vagina, and then closing the abdominal wound. Drainage is then carried out through this vaginal tube and the cyst irrigated as often as may seem necessary. The result, of course, should be a gradual contraction and obliteration of the sac. We do not feel disposed to recommend this latter plan, having been uniformly successful with the abdominal method.

Occasionally we have first aspirated such adherent cysts through the vagina under proper antiseptic precautions, and after ascertaining by examination of the fluid that the cyst was ovarian, we have punctured the cyst with blunt-pointed scissors, enlarged the incision with a dilator, evacuated the contents, irrigated, and drained. Some of our cases treated in this manner have resulted successfully; others, again, have continued to secrete for an indefinite period, and in one case of intraligamentous cyst recently met with an unexpected secondary hemorrhage took place during the night, undoubtedly from rupture of one of the large blood-vessels in the wall of the cyst, and the patient succumbed before the hemorrhage could be arrested [P. F. M.].

INTRALIGAMENTOUS CYSTS. — *Definition.* — An intraligamentous ovarian cyst is one in which the tumor, instead of developing toward the abdominal cavity, grows inward and downward between the layers of the broad ligament, which it pushes before it anteriorly, posteriorly, and laterally, until it occupies a part or the whole of the pelvic cavity and encroaches upon the abdominal cavity, precisely as does an ordinary ovarian cyst. Still, as a rule, these intraligamentous tumors do not grow upward as freely and as rapidly as pediculated ovarian cysts, but are distinguishable by their firm and deep situation in the pelvic cavity and by their entire absence of mobility.

Diagnosis.—The diagnosis is made by the signs just pointed out; that is, by the deep situation and immobility of the cyst in the pelvic cavity, by the pushing of the uterus to the opposite side and forward, and by the comparatively slight enlargement of the abdomen. Diagnostic aspiration made through the vagina reveals under the microscope the characteristic granular corpuscle of Drysdale, showing the cyst to be ovarian and not of the parovarium or a serous effusion between the layers of the broad ligament.

Significance.—In our opinion these intraligamentous cysts of the ovary are the most difficult to handle—that is, to extirpate successfully —of any tumors of the ovary which it has been our fortune to meet. The reason for this statement is that such a cyst possesses no pedicle, and therefore, in order to remove it, must be shelled out or enucleated from its bed between the layers of the broad ligament. This in itself is a difficult piece of work, involving danger of rupture of the enveloping peritoneum and of blood-vessels which may produce severe hemorrhage. Besides, after the enucleation of the sac, supposing it to have been successful, a large bleeding, freely-absorbing cavity is left behind which requires a long time to close, during which process the danger of septicæmia is never absent. The greatest danger in our mind results from the breaking down of the enveloping peritoneum during the enucleation of the sac. A ragged, bleeding, and freely absorbing cavity is then of necessity left behind, and remains a source of danger, and not infrequently of death. It is but seldom that a small intraligamentous cyst of the ovary can be lifted out of the abdominal incision, together with its enveloping folds of broad ligament, so as to enable the operator to form a pedicle, ligate, and remove the cyst with its peritoneal covering entire.

Treatment.—After opening the abdominal cavity, instead of the smooth, glistening, pearly-white, or mottled surface of a pediculated ovarian tumor, we find a red, very vascular membrane presenting, and on introducing the fingers it is found that this membrane extends over to the pelvic wall on the respective side and to the fundus uteri on the other. There is no pedicle to be found, and it is evident that the tumor is one developed between the layers of the broad ligament. We can now either close the abdominal wound and open this cyst *per vaginam*, as already described in the preceding section on irremovable cysts, or we can seize the sac with vulsella forceps, draw it up as much as possible into the wound, incise it so as to avoid injuring prominent blood-vessels, and, having evacuated its contents by means of the trocar and the fingers in the usual way, draw it up still more and endeavor to enucleate the cyst. If this is successful, the walls of the sac enclosing the cyst—that is, the folds of the broad ligament—are stitched to the edges of the abdominal incision by interrupted sutures passed entirely through the abdominal wall and the sac. The peritoneal cavity is thus entirely shut off from communication with the abdominal incision and the cavity situated between the layers of the broad ligament. If the whole of the cyst cannot be thus enucleated, as much as possible should be detached, removed, and the walls of what remains stitched to the abdominal wound as already described. A large cyst can in this way be very much diminished in size, and the cavity left to be filled up reduced to quite a small dimension. Having stitched the walls of the sac to the abdominal incision, the sac is irrigated with Thiersch's solution and packed with iodoform gauze, the subsequent treatment being precisely like that described in the previous section. We have had many excellent results from this plan of treatment, but we have been unfortunate enough to lose a number of cases from septic peritonitis and intestinal obstruction, in which the broad ligament had become so thin and friable that it was torn during attempted enucleation, and the removal of the ovarian cyst was found to be impossible. In such cases it was of course impracticable to stitch the torn edges of the broad ligament to the abdominal wound, and thereby close off the sac from the peritoneal cavity, and thus opportunity was given for septic infection of the latter and intestinal adhesion, which brought about the fatal result.

SOLID TUMORS.—The removal of solid tumors of the ovaries differs in no way from that of fluid or mixed cysts, except that the incision will have to be made of sufficient length to enable the operator to remove the tumor through it. The length of this incision will of course depend entirely upon the size of the tumor. The pedicle is usually thin and easily ligated and dropped. In cancerous tumors of the ovary the precaution should be taken to apply the ligature so far away from the tumor that it will lie in healthy tissue, since if the pedicle has already become diseased the ligature is very liable to cut and immediate or secondary hemorrhage to result, which will probably prove fatal unless soon discovered. The chances of recovery after the removal of cancerous tumors of the ovary will depend wholly upon the possibility of the entire removal of the malignant growth. If it has once spread by metastasis to the peritoneum or intestines, the operation may indeed prove successful, but the disease will inevitably return.

CHAPTER XLV.

OÖPHORECTOMY.

Definition.—Oöphorectomy means the removal of the apparently normal ovaries; that is, of ovaries which, so far as previous touch or macroscopical examination after their removal shows, are perfectly healthy. This operation has also been called normal ovariotomy—a term which is no longer employed: castration is the medical, spaying the popular, term for this operation. We have said that the ovaries are apparently normal, because under the microscope minute histological changes are often found in these organs, such as hyperplasia and atrophy of the stroma, not uncommon results of chronic ovarian congestion or inflammation, which are not apparent to the naked eye, and which still have a decided influence upon the production of the symptoms (local pain and reflex neuroses) which call for the operation.

History.—As the creation of the male eunuch by removal of the testicles has long been known as a procedure practised for other than scientific purposes, so probably has that of the female eunuch by removal of the ovaries. The former procedure was, however, very commonly put into practice; the latter very rarely so. The former is substantiated by unquestionable evidence; the latter rests merely upon vague tradition, which asserts that a king of Lydia had it practised upon a lewd daughter, and that in India female eunuchs were thus created in the olden time. In the seventeenth century an Hungarian swineherd is said to have castrated his daughter for the same reason as the Lydian king.

In the lower orders of animals spaying has long been very extensively practised, and is so to-day.

In 1823, James Blundell of London formally suggested the practice of this operation in a paper presented to the Royal Society of Medicine and Surgery of London. In this he suggested that the extirpation of the healthy ovaries would probably prove remedial for severe dysmenorrhœa and for the menorrhagia which accompanies inversion of the uterus, where amputation is not practicable.

On Aug. 17, 1872, Dr. Robert Battey of Georgia performed the operation for the removal of the healthy ovaries for the premature production of the menopause. Battey's indication for the operation was dysmenorrhœa of so severe a type that it rendered the life of the patient unendurable, influenced her general health, and had proved incurable by all other remedies. Hegar of Freiburg, in Baden, performed the same operation for the same object on July 27, 1872, but, the patient dying, failed to publish his experience. Hence this operation for this particular purpose has been, and is still, called "Battey's operation." In the month of January, 1876, Trenholme of Montreal performed the same operation, also for the purpose of bringing on the change of life, but not to relieve dysmenorrhœa, his purpose being to stop the bleeding and the growth of a uterine fibroid. In August of the same year Hegar independently performed the same operation, and he has since done so much to popularize this method of checking otherwise uncontrollable hemorrhage from uterine fibroids that the operation for the removal of the normal ovaries for this purpose has become known as "Hegar's operation." Lawson Tait claims to have performed the same operation for the same purpose in August, 1872, but he failed to publish his case until after Hegar's report, and hence his claim cannot be officially recognized.

Theory of the Operation.—Dr. Battey, basing his reasoning upon the fact that ovulation is the cause of menstruation, with all its accompanying pelvic engorgement and nervous exaltation, drew the deduction that extirpation of the ovaries by putting a stop to ovulation would check its consequence, menstruation, and that thus many evils dependent upon these two processes would by it be cured. Such was his conclusion, and to test the question he began practising the procedure. Very soon he was followed by others.

Since then men of the highest reputation and greatest experience have from time to time published the results obtained by them from this operation, and expressed their opinions regarding its justifiability and indications. The late Prof. Schroeder was one of those who gave this operation for the indications first suggested by Battey a most thorough trial, and reported shortly before his death in 1887 a series of 10 cases of reflex mental and nervous disturbances supposed to depend upon the disordered functions of menstruation and ovulation.[1] His recital is most graphic and of exceeding interest and importance, and his results are instructive and to our minds quite conclusive. Out of the 10 cases operated by him, in only 4 was a recovery achieved which bade fair to be permanent. In the 6 others no or only temporary improvement resulted, and in several of these the condition even became worse. The operation cannot be said to be popular at the present day, and is justifiable only in extreme cases after exhaustion of all other known remedies and when sanctioned by consultation with other prominent gynecologists and neurologists.

The removal of the ovaries for the production of the premature menopause in cases of bleeding fibroids is, however, quite another matter, and stands upon an entirely different and more stable basis. Our experience is that in such cases oöphorectomy not only checks the bleeding almost immediately in a large proportion of cases, but frequently also is followed by a diminution, and even entire absorption, of the fibroid. Of course there are a certain number of failures, but generally the operation is successful.

Results.—These should be divided into immediate and remote. The immediate results from removal of the ovaries other than for cystic disease are exceedingly favorable; indeed, one would scarcely expect a woman to die after the ablation of the apparently normal ovaries. The remote results, however, leave very much to be wished for. This remark applies almost entirely to the operation when performed for the relief of reflex mental and nervous disturbances. Local pain, such as dysmenorrhœa or that accompanying chronic oöphoritis, will of course be relieved, but hystero-epilepsy, insanity occurring at times, convulsions, hystero-neuroses other than epilepsy, are by no means relieved with a certainty or permanency which one could desire, and which would justify the frequent performance of this operation. If the local pain is due to adhesions of the ovary, the detachment and removal of the organ will probably result in complete relief; but we must warn most emphatically against the indiscriminate and hasty removal of ovaries for reflex nervous and mental troubles the exact relation between which and the ovarian functions cannot clearly be established. While the majority of women do recover from simple oöphorectomy, this operation must still not be considered as either an entirely safe or a trifling one, since some do die, and in any case the removal of organs of such vital importance to a woman as are the ovaries should be well considered before it is practised. We do not look upon this question from the sentimental standpoint, and consider the operation immoral, or believe that it unsexes a woman, as has been stated, because we think that if the suffering complained of is to be relieved only by this operation, its performance is certainly justifiable; and in our opinion a woman is not unsexed or deprived of her womanly feelings, or even sexual instinct, by the removal of the ovaries. Indeed, we have seen one instance in which, after the removal of the ovaries for a bleeding fibroid in a single woman of thirty-seven marriage took place, and extreme gratification during the sexual act was acknowledged by the patient [P. F. M.]; and in no instance have we seen a woman changed physically or mentally from the normal condition after this operation.

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[1] "Die Castration bei Neurosen," *Zeitschr. f. Geb. u. Gyn.*, xiii. 2, 1886.

To enumerate all the operators and the operations of this kind which they have performed would now be too great a task, since the number of both is too large, nor could we learn from such a table how the operation is viewed by different operators, since we believe that the removal of the normal ovaries for reflex neuroses has greatly diminished during recent years, although at first it was enthusiastically received throughout the world. Battey's operation, therefore, may be said to be on the wane, while Hegar's operation, on the other hand, holds its own. In this respect no change has taken place during the last ten years, and the opinion expressed by Mundé in 1878 (see *American Journal of Obstetrics*, vol. xi., 1878), "If the positive benefits of the operation were as assured as its rate of recovery, the opposition to it would soon cease," remains as true now as it was then.

Indications.—Ovarian extirpation is recommended for the following conditions:

Severe dysmenorrhœa;
Excessive menorrhagia;
Insanity occurring at times of ovulation;
Hystero-epilepsy;

Excessive hemorrhage with uterine tumors;
Hystero-neuroses, other than epilepsy of severe character;
Chronic oöphoritis with severe symptoms;
Absence of vagina or uterus, the ovaries being present.

Of course the surgeon would have to decide according to his judgment and his conscience whether the evils for which he proposed operating were of so grave a character as to warrant his exposing his patient to a procedure of the gravity which the sequel will prove this to be.

The difficulties, the dangers, and the doubtful results of Battey's operation render it one to be avoided until all other resources have been tried, but when these have been exhausted, and death, or, what is oftentimes worse, a life of suffering, becomes the certain fate of the patient, it offers itself as a resource of great value.

Methods of Operating.—The ovaries may be extirpated, either by cutting through the vagina into the peritoneal cavity, elytrotomy; or by cutting through the abdominal walls, laparotomy. The statistical evidence is somewhat in favor of the former of these, but the difficulties, the uncertainty of success, and the possibility of cutting into the rectum make the latter decidedly preferable, except in certain exceptional cases which will soon be mentioned. In a number of cases, even after elytrotomy, it has been found impossible to remove the ovaries, which were hidden away under masses of effused lymph, and as a secondary procedure laparotomy has been resorted to.

The removal of the ovaries through the vagina has at the present day been practically abandoned, although in many instances, where the organs can be plainly felt through the vagina and are not adherent, the operation would be an exceedingly easy and safe one; but the majority of operators have united in adhering to the abdominal section, which they find quite as easy and safe, and less liable to be disturbed by possible complications than, the vaginal operation. There is no particular difference in the technique of this operation from that described under Ovariotomy, except that we consider the opening of the abdominal cavity more difficult in this case on account of the non-distension of its walls, of the greater rigidity of the muscles, the usually greater amount of adipose tissue, and the danger of wounding omentum or intestine in nicking the peritoneal membrane. It should be stated that the tubes are always removed together with the ovaries in this operation. Formerly, we believe, this was not considered essential, and was not always done, but at present we think the removal of the tubes, which are assumed to be as healthy as the ovaries, to be an indispensable part of the operation. It is not because we hold, with Lawson Tait, that the tubes are, in part, the seat and origin of the menstrual flow, and that their being left behind would result in a persistence of that flow, but because their removal together with the ovaries is equally easy, and indeed a pedicle can be more easily formed if both organs are removed together. Besides, in the absence of the ovaries the tubes are of no possible use, and may even, if they remain permeable, give rise to subsequent trouble. The removal of loose, non-adherent ovaries and tubes is one of the easiest operations; the pedicle is readily transfixed, tied, and dropped, and the abdominal wound closed; the whole operation occupying not more than ten or fifteen minutes, and, as already stated, recovery should be almost uniform. We need not say that all antiseptic and other precautions enumerated under Ovariotomy should be observed and carefully carried out precisely as for that operation.

Persistence of Menstruation after Removal of the Ovaries and Tubes.—Although usually the extirpation of the normal ovaries and tubes should effect the complete cessation of the menstrual flow, such occasionally is not the case, and every operator of extensive experience has met with a number of cases in which menstruation reappeared after this operation at more or less regular intervals for a certain length of time. In our experience this has been the case in about 4 per cent. of our cases. When the ovaries and tubes were diseased (not enlarged to tumors) and adherent, the persistence of a bloody discharge from the uterus at regular intervals has been even more frequently met with. How to explain the recurrence of menstruation after removal of both ovaries and tubes is not quite easy, and there are different opinions on this subject; some believing that it is merely the persistence of the natural habit; others, that a portion of the ovary was left behind; and others, again, that a third ovary exists. Each of these explanations may account for a certain number of cases. It is well to acquaint our patients with the possibility of this occurrence in order that they may not be disappointed or surprised, and imagine the operation a failure, and we should also inform our patients that an immediate cessation of the pain or reflex symptoms for which the operation was performed must not always be expected, and that some months may elapse before decided beneficial results may be experienced; and they should also be prepared for the inevitable discomforts of a mental, neurotic, and physical character which accompany the establishment of the menopause, and are liable to extend over a number of months or even one or two years.

CHAPTER XLVI.

DISEASES OF THE FALLOPIAN TUBES.

Anatomy.—The identity of structure of the Fallopian tubes and uterus will be appreciated by the study of the formation of these organs in the embryo, as described by recent observers, more especially by Leukart, Thiersch, and Kölliker.

In the walls of the Wolffian body, situated near the kidneys, on each side, in the female embryo, a narrow canal develops which ends below in the two horns of the uterus, while the distal extremity performs "a movement of rotation from before backward and from above downward; the whole, together with the ligaments of the ovaries and the round ligaments, being enveloped in double folds of the peritoneum, which enlarge with the growth of the parts themselves, and constitute finally the broad ligaments of the uterus."[1] Coming together at the median line, these canals coalesce or undergo fusion, forming the lower portion of the uterus and the entire vagina down to the hymen. The fundal arch is now formed, in all probability from fusion progressing from below upward, although this is somewhat doubtful. Thiersch[2] thinks from observation on the embryos of sheep that it occurs from below upward; while Kölliker, who experimented on those of cattle, believes that it occurs from the centre. Prof. Dohrn, who experimented upon embryonic foxes, sheep, pigs, and cattle, concludes that it begins between the middle and lower third, and extends upward and downward. All this occurs very early in embryonic life; according to Dohrn, it is completed by the end of the second month. From the fact of this identity of structure there naturally exists between these organs a close sympathy in health and disease.

In the adult woman, according to Carl Hennig,[3] the right tube is nine and a half centimetres (three and three-fourths inches), while the left measures only eight and a half. The abdominal extremity has attached to it five large and ten small fimbriæ. The walls of these tubes consist—1st. Of peritoneum, which covers them to the fimbriated extremities; 2d. Of connective tissue, in which are interspersed two sets of muscular fibres, external or longitudinal and internal or transverse, which are continuations of the muscular tissue of the uterus and broad ligaments. At the point where these tubes enter the uterus Hennig declares that the longitudinal and transverse layers of fibres both become greatly developed, and that the latter forms here a distinct *sphincter tubæ*. 3d. We find within and lining the tube a mucous membrane, which is thrown into large and small folds, which are very evident near the fimbriated extremity, and gradually become insignificant as we advance toward the uterus. Within this membrane Mr. Bowman discovered tubal glands, which consist of grape-like structures, extending downward toward the subjacent muscular fibre. They differ from the muciparous follicles of the vagina, the Nabothian glands of the cervix, and from the utricular follicles of the uterine cavity. Kölliker denies the existence of these, but Hennig[4] describes them very fully. These compound glands of the Fallopian tubes are lined with an epithelium of basement form. The mucous membrane covering over the tubes, and not dipping down into these glands, is covered by a ciliated epithelium, the broom-like action of which is exerted toward the uterus. The object of this seems to be to sweep the products of the ovaries into the uterus, and to force in the same direction menstrual blood oozing into the tubes from their mucous lining, as a result of ovulation. The zoosperms, which are known to pass through the uterus and proceed as far as the ovaries, are themselves endowed with powerful ciliary action in the single cilia which each possesses, and by this they overcome the opposing force of the tubal ciliæ.

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[1] *Treatise on Human Physiology*, by J. C. Dalton, p. 645.

[2] Prof. Dohrn of Marburg, "Transac. Insbruck Convention," *Amer. Journ. Obst.*, vol. iii. p. 167.

[3] *Uterine Catarrh*, translation in *Am. Journ. Obst.*, vol. iii. p. 468.

[4] *Loc. cit.*, p. 473.

It is highly probable, to say the least, that the erectile condition induced in the mucous membrane of the uterus and tubes by contraction of the middle coat of their muscular fibres produces in the latter, as in the former, rupture of blood-vessels and consequent hemorrhage. Hennig declares that "during[1] menstruation, throughout its entire surface, it (the mucous membrane of the tubes) assumes a dark-red color." Ruysch, an old anatomist of Amsterdam, who wrote in 1737, describes a post-mortem examination in which he discovered the Fallopian tubes containing blood. This has by some of the writers upon the history of hematocele been construed into a record of that affection, but the passage appears to refer merely to a condition which depends upon ovulation. Messrs. Bernutz and Goupil[2] mention instances of the collection of blood in the Fallopian tubes in consequence of obstruction of these canals. Dr. Duncan[3] admits that some blood may come from the tubes in natural menstruation. Tait, Bandl, Johnstone, and other recent authors insist that blood exudes physiologically from the healthy tube during normal menstruation; and we see no reason to doubt this occurrence. We have repeatedly found the tubes, in cases where we performed laparotomy near the menstrual period, in an intensely congested state, which was not due to catarrhal inflammation; and twice Thomas saw menstrual blood discharged from the tube enclosed in a clamp after ovariotomy, the patient at the same time menstruating from the vagina.

MALFORMATIONS OF THE TUBES.—The tubes may be congenitally absent, as in absence of the uterus and ovaries, or they may be of unequal length, or the fimbriated extremity may be double, there being two ostia; or there may be found one or more small cysts of the size of a pea or bean dependent from the fimbriæ. These cysts are believed to be an elongation of Müller's duct: they were first described by Morgagni, and are called "Morgagni's hydatid." They are found so often—that is, about once in every five cases—that they can scarcely be considered pathological. They have no special significance, except that they may become adherent to the intestine or neighboring peritoneum, and then cause distortion of the tube and possibly extra-uterine pregnancy. Other distortions of the tubes are produced by inflammatory adhesions and constrictions, and will be considered in the next section.

The diseases by which the Fallopian tubes may be affected are the following:

Inflammation;
Stricture;
Distension;
Displacements.

Tumors.

INFLAMMATION OF THE TUBES, OR CATARRHAL SALPINGITIS, consists in inflammation of their mucous membrane, and may be either acute or chronic.

The acute variety generally results from puerperal endometritis, or from gonorrhœa, which has extended through the uterine mucous membrane. [I have twice seen this disease almost destroy life by attacking the uterine mucous membrane, and subsequently producing pelvic peritonitis, doubtless reaching the peritoneum by traversing the tubes.—T. G. T.]

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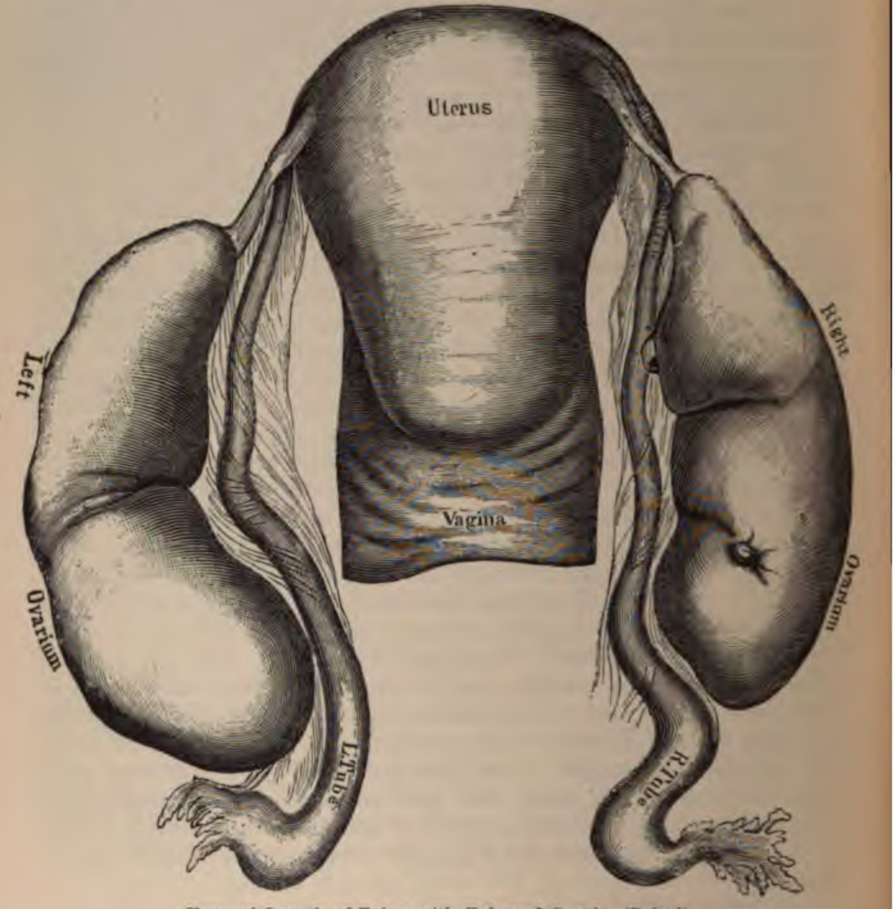
[1] *Loc. cit.*, p. 470.

[2] *Op. cit.*, vol. i.

[3] *Fecundity, Fertility, and Sterility*, p. 388.

FIG. 319.



Unusual Length of Tubes with Enlarged Ovaries (Beigel).

Dr. Noeggerath, then of New York, in 1876 astonished the medical world by the publication of a work entitled *Latent Gonorrhœa in the Female Sex*,[1] which was published in the German language, but soon became widely known in every country. In this work he claimed that, as the result of personal experiences of many years in his own practice, one of the most common causes of female sterility was the production of inflammation of the Fallopian tube in consequence of uncured gonorrhœa or gleet in the husband. He affirmed, indeed, that no well-marked case of gonorrhœa in the male was ever entirely cured, and that consequently infection of the female was a common result soon after marriage. The poison of the uncured gonorrhœa or gleet was carried into the uterus with the semen, and thence to the mucous membrane of the tubes, there exciting catarrhal inflammation and suppuration, eventually discharge of pus into the peritoneal cavity, localized peritonitis, and adhesions sealing up the fimbriated extremity of the tube or attaching it to the ovary or the neighboring peritoneum. In this way both the ova and the spermatozoa would be prevented from entering the tube, since the uterine extremity of the tube also was often closed by adhesive inflammation. At first Noeggerath's views were received with a great deal of scepticism, and were admitted to be true only for a very limited number of cases; but gradually they have gained ground, and undoubtedly are now correct in very many instances where formerly the disease was attributed to other causes. There can be no doubt, however, that he went entirely too far when he asserted that no case of gonorrhœa in the male was entirely cured, and always remained a source of danger to the woman with whom such a man had intercourse. If that were the case, probably but very few women who marry young men who have been more or less gay in their early lives would be free from pelvic disease or would have children; and every one knows, perhaps more or less from personal experience, that this is not the case. Noeggerath's statements apply to a very large portion of the community, but still by far to the minority.

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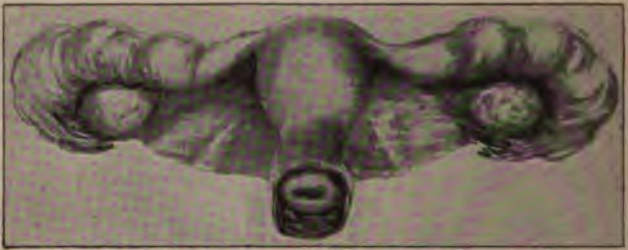
[1] *Die latente Gonorrhoë im weiblichen Geschlect*, Bonn, 1876.

We have no doubt that many cases of acute catarrhal salpingitis are due to the extension of a chronic endometritis to the tube, and perhaps even to some active cause, such as exposure to cold during menstruation, excessive venereal excitement, imprudence in exercise during very cold weather, such as skating, equestrianism, bowling, etc., followed perhaps by rest on the cold ground while overheated. We have seen a case of pyo-salpinx in a young girl of sixteen produced by exposure to cold after overheating during skating, and we have seen numerous cases of catarrhal salpingitis in young women whose intact hymens precluded the slightest possibility of venereal infection.—[P. F. M.] Chronic salpingitis may either follow the acute stage, or else it may be the result of a gradual and slow extension of a chronic endometritis; while in the milder forms the tube retains its normal calibre, and the catarrhal inflammation shows itself only by an increase of hyperæmia of all the tissues of the canal. If the disease lasts for a long period or is of a very aggravated type, gradually the other tissues of the tube besides the mucous membrane participate in the inflammatory process, and a hyperplasia of the muscles and areolar tissue takes place which results in an hypertrophy of the tube, which may then attain the diameter of the little finger or even larger, its walls being hard and tense and the calibre of the tube often diminished instead of increased. The secretion contained in such an hypertrophied tube is either mucus or serum and mucus, or perhaps a drop of thin pus; but this is not pyo-salpinx, properly speaking, since there is no accumulation of pus or dilatation of the tube. Of course, if the fimbriated and uterine extremities of the tube become closed, gradually an accumulation of secretion may result in dilatation of the canal and the formation of a hydro- or pyo-salpinx. This condition of inflammatory hypertrophy of all the tissues of the tube has been called independently by Mundé[1] and Kaltenbach[2] "pachysalpingitis," or inflammatory thickening of the tube. It is a very common disease, and met with in our experience far more frequently than pyo-salpinx proper. An hypertrophied tube is usually distorted in shape and bound to the ovary and Douglas's pouch by adhesions.

FIG. 320.



Fallopian Tubes, thickened, distorted, and adherent by local peritonitis (pachysalpingitis) (Mundé).

The great danger in both acute and chronic salpingitis is pelvic peritonitis, which may spread and destroy life. This arises in part from escape of the contents of the inflamed tubes into the peritoneum.

A general peritonitis from the escape of the contents of a tube which is in the condition of acute or chronic catarrhal inflammation is rarely met with. The inflammation of the peritoneum is generally confined to Douglas's pouch, and results in the formation of adhesions between the tube, ovary, and neighboring surface of peritoneum, chiefly the posterior layer of the broad ligament. These adhesions effectually seal off the rest of the peritoneum from the inflammation, which therefore does not spread, and hence seldom endangers life. It is only in consequence of a repetition of this inflammatory process, which may take place any number of times, that eventually local suppuration and consequences perhaps endangering life may set in. Constriction and closure of the tube are by far the most common results of salpingitis, but we are in doubt as to whether it ever occurs except in consequence of the retention of fluids in that canal, and before such retention can take place stricture of its two orifices must be present.

Some authors have thought that they had succeeded in passing the uterine sound through the tube into the peritoneal cavity. Cases apparently proving this fact have been reported by Hildebrandt, Veit, Matthews Duncan, Noeggerath, Thomas, and others. It is a question whether in those cases the sound really entered the dilated tube, or whether the soft, pulpy fundus uteri was not perforated by the instrument. The latter accident has occurred so frequently (see chapter on the Uterine Sound) and in the most experienced hands that we cannot help believing that the cases of sounding of the tube referred to were really instances of perforation of the fundus. Strange to say, this latter accident usually entails no serious consequences.

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[1] "Electricity as a Therapeutical Agent in Gynecology," *Am. Journ. Obst.*, 1885, p. 1256.

[2] *Centralbl. für Gyn.*, No. 43, Oct. 24, 1885.

Symptoms.—The signs of an acute salpingitis are very similar to those of a localized acute pelvic peritonitis—namely, sharp pain in one side of the pelvis or the other (usually in both, since, we may add, this affection is more likely to be bilateral than confined to one side only), moderate rise of temperature and pulse, and considerable constitutional disturbance. An examination reveals merely a greater amount of tenderness in one or both ovarian regions; perhaps, if the examiner is very expert or unusually fortunate, the detection of the swollen tube. One of the most common symptoms of the chronic form of catarrhal salpingitis is the recurrence of painful menstruation, so-called menstrual colic; which attacks are often very similar to those of chronic peritonitis of a mild type. In prostitutes this menstrual colic is due usually to salpingitis, and many young married women undoubtedly acquire the disease from excessive sexual indulgence during the honeymoon. A leucorrhœal discharge, usually of a sero-purulent character, is present in such cases, sometimes coming on in gushes, as though there were a discharge of accumulated secretion from the uterus or the tube.

The *diagnosis* is usually made by these symptoms and by the exclusion of inflammation of the ovary, which can be felt as neither enlarged nor particularly tender, and of an intra-peritoneal exudation. The diagnosis of the chronic variety is very much more satisfactory, since, particularly when a pachysalpingitis exists, the tube can very easily be mapped out by bimanual examination, and although it is not by any means easy to distinguish it from the ovary, the presence of an irregular, tender, slightly movable mass of the size of half a lemon or a mandarin orange will usually enable the examiner to decide that he has before him the enlarged, inflamed, distorted, and adherent tube, encircling the probably not enlarged ovary. A certain amount of practice is of course required to make this diagnosis, and no amount of experience in digital examination will enable the examiner to detect with absolute certainty the exact condition of the appendages. In such cases their precise condition and relations can be determined only by the fingers introduced through an abdominal incision, and often then not until the adhesions have been loosened and the appendages brought out of the abdominal cavity. Accuracy of diagnosis is, therefore, impossible in a large number of these cases, and is not indeed absolutely essential either to the formation of the indication for the removal of the appendages or for success in the operation. The density of the adhesions and the possibility of detaching the appendages are really the important points in the operation, and these can never be foretold. A limited mobility of the small irregular mass found at one side of the uterus is a sign of its intra-peritoneal location, but this limited mobility does not mean the absence of adhesions or necessarily an easy detachment of the appendages.

Frequency.—The frequency of both acute and chronic catarrhal inflammation of the Fallopian tubes is now recognized to be so great that there may scarcely be said to be a pelvic disease in the female which is more commonly met with than this. Our recognition of this frequency is, strange to say, only of very recent date. Pelvic cellulitis and pelvic peritonitis, and even oöphoritis, were for years looked upon as the diseases which we now know to be simple inflammation of the Fallopian tube. True, simple, uncomplicated salpingitis is comparatively rare, and oöphoritis and local peritonitis usually follow or accompany it. The merit of having recognized the great frequency of the acute inflammation of the Fallopian tubes with their complications and consequences is due above all others to Lawson Tait of Birmingham, England, who has done more to acquaint the profession with the symptoms, diagnosis, and operative cure of these diseases than any other one man.

Treatment.—Even though the diagnosis may be doubtful, the treatment will be practically the same as for acute pelvic peritonitis—namely, rest; if the temperature goes above 102°, ice to the hypogastrium; otherwise hot applications, blisters—perhaps leeches, hot douches. When the chronic stage has set in, frequent blistering over the tubo-ovarian region, counter-irritants to the vaginal vault, hot douches, warm alterative sitz-baths (Kreuznach brine or rock-salt), perhaps local galvanism for pain, may bring relief or possibly, in exceptional cases, a cure. Adhesions of course can never be entirely absorbed, and the hypertrophied tube will probably always remain more or less a source of annoyance to its possessor. Avoidance of sexual intercourse is of great importance, but probably difficult to enforce, since the disease is chronic. Eventually, if pain or recurrence of attacks of local inflammation warrant, the removal of the diseased appendages by laparotomy is indicated.

Results.—An acute catarrhal inflammation of the tube not due to gonorrhœal infection may recover spontaneously or under appropriate treatment, and the organ be restored to its normal condition. When once suppuration has taken place and adhesive inflammation has closed the fimbriated extremity (which is usually the first to be thus affected), and perhaps also the uterine end, the tube has become thickened, distorted, and more or less adherent to the neighboring peritoneum; then of course a restoration to health is out of the question, and, even though the symptoms may be trifling and the pain experienced slight, one result is always present—namely, sterility. As this disease usually affects both tubes in consequence of the tendency of catarrhal inflammations to spread wherever a mucous membrane exists, and therefore from the endometrium to both tubes, the sterility is usually absolute, and no treatment whatever avails to relieve it. Still, even with inflamed and dilated tubes (at least temporarily dilated), conception may occur against all expectations. We have seen several such instances, where that event could be possible only on the supposition that at the moment of coition the tubes were temporarily permeable.

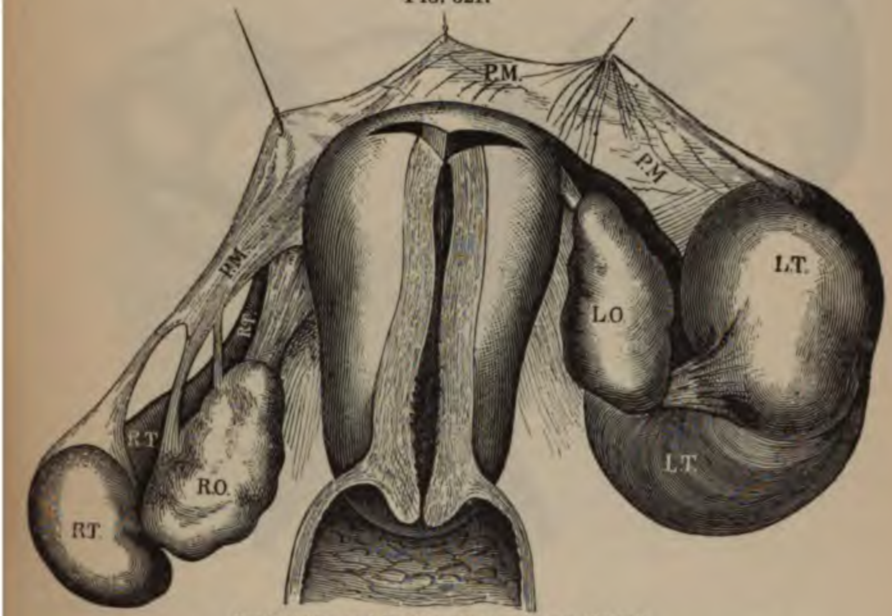
Distortion and Stricture.—The conditions which produce twisting and occlusion of the Fallopian tube are the following:

Acute and chronic salpingitis;
Pelvic peritonitis;
Senile atrophy;
Tubercle or fibrous tumors.

As a result of this distortion and occlusion of the canal, accumulations of fluid frequently take place in the tube, forming either one large sac or a number of small sacs accordingly as only the fimbriated and uterine extremities are occluded or as a number of constrictions occur along the lumen of the tube. The fluids thus imprisoned in and dilating the Fallopian tubes may be either mucus and muco-serum (hydro-salpinx), blood (hemato-salpinx), or pus (pyo-salpinx).

Over-great distension of the tube by any of these fluids may result either in a rupture of the organ and the evacuation of the fluid into the peritoneal cavity or between the layers of the broad ligament; in the former instance death being a not uncommon result unless speedy operative interference is at hand; in the latter, sacculation of the effused fluid in the pelvic cellular tissue. Or the fluid may force its way out through the fimbriated orifice, producing peritonitis, or into the uterine cavity, to be evacuated by the vagina. These tubal cysts may attain a considerable size, even to that of the head of a child of ten years. We have removed a hemato-salpinx which was even larger than that. [See Fig. 323, P. F. M.] Pyo-salpinx sacs seldom exceed the size of a small sausage or a banana.

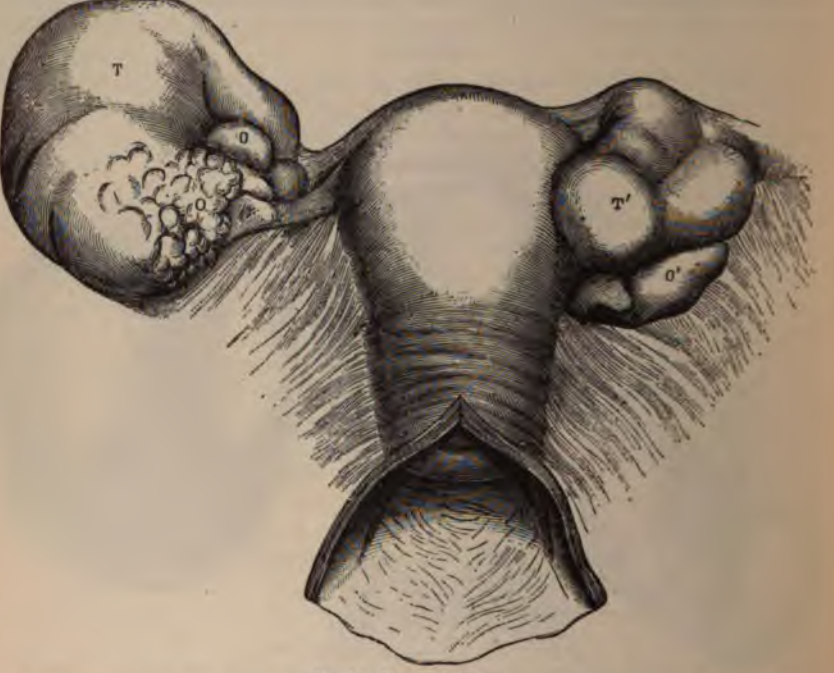
FIG. 321.



Perimetritis and Double Hydro-salpinx (Beigel).
R. T., right tube; R. O., right ovary; L. T., left tube; L. O., left ovary; P. M., perimetritic adhesions.

Hydro-salpinx.—The symptoms of hydro-salpinx are usually much less marked than those of the other varieties, being merely pain and pelvic pressure; indeed, the history of catarrhal salpingitis and pelvic peritonitis of a very mild type. An examination reveals a tense, smooth, elastic mass of an oval shape, usually lying immediately behind the cervix at the bottom of Douglas's pouch. If pelvic peritonitis has existed, this elastic mass is adherent, otherwise it may be movable. An aspirator introduced into it *per vaginam* under antiseptic precautions shows merely a transparent watery fluid, which under the microscope reveals nothing but a few columnar and tessellated epithelia. Aspiration or incision with irrigation and drainage will usually cure such cases. If the tube was adherent, the refilling of the sac, however, is not uncommon; if the tube was loose, its removal by laparotomy would probably be the wiser plan, since the removal of the ovary, and perhaps of the appendages of the other side if at all involved, could be performed at the same time. Hydro-salpinx, as a rule, is by no means as serious an affection as either hemato-salpinx or pyo-salpinx, and seldom endangers the patient's life.

FIG. 322.

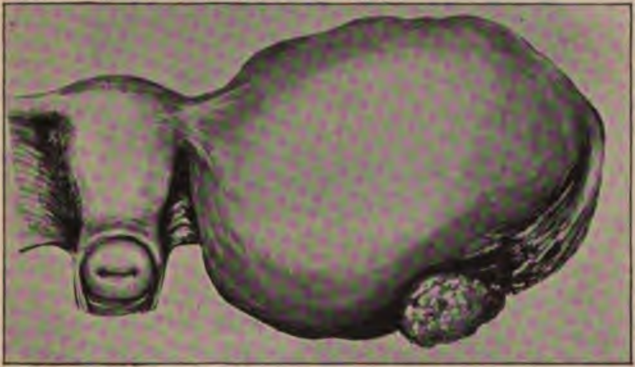


Double Hydro-salpinx.

T, left hydro-salpinx; O, left ovary degenerated into a cyst; T′, right tube with abdominal mouth closed; O′, right ovary. Two-thirds natural size (Beigel).

Hemato-salpinx.—Either as a result of a regurgitation of menstrual blood into the tube (which we consider rather improbable), or of the regular monthly discharge of blood from the tubal mucous membrane, both extremities of the canal being occluded, or, finally, in consequence of the rupture of the lining membrane of a tubal pregnancy, a certain amount of fluid blood accumulates in the Fallopian tube and distends it to a greater or lesser diameter. Accordingly as the effusion of blood is gradual the symptoms of pain, chiefly at the menstrual period, and of pressure in the affected side, will make themselves felt; or, as the effusion is sudden, the access of pain will be proportionately rapid and severe. The amount of blood accumulated in a dilated tube is usually not sufficient to produce any marked effect upon the blood-supply of the whole system, and hence anæmia is not a symptom of this affection. A physical examination reveals very similar conditions to that mentioned under Hydro-salpinx, except that usually there are no signs of pelvic peritonitis present, at least not as a direct result of the distension of the tube. The mass is oblong or oval in shape, or if adhesions are present it may assume even a globular outline. It may be entirely movable or more or less adherent. It usually bulges down into the vagina, and is easily reached by the aspirator through this canal, when the diagnosis of a sac containing blood is made. Whether the sac is the tube or the ovary will often remain in doubt until laparotomy is performed. If the tumor is probably intra-peritoneal, its removal by laparotomy is undoubtedly indicated, and should be performed as early as the diagnosis is made, before rupture of the sac, which may occur at any time, can take place. If the distension of the tube has pointed between the layers of the broad ligament—which fact can be suspected in consequence of the deep situation and comparative immobility of the sac—aspiration, incision, and drainage through the vagina will probably offer a better prospect than laparotomy. This intraligamentous development of hemato-salpinx is not at all infrequently produced by a tubal pregnancy, and the pain and faintness caused by the rupture between the layers of the broad ligament are usually the first symptoms to which the attention of the physician is called.

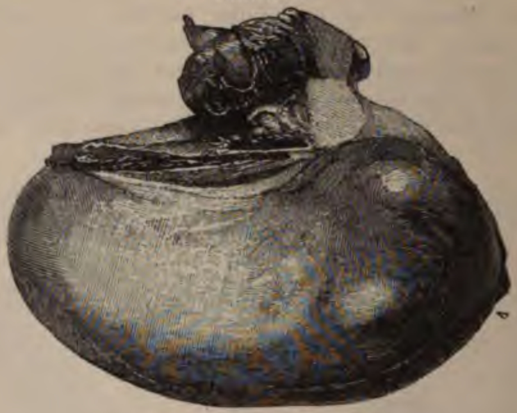
FIG. 323.



Large Hemato-salpinx, diagrammatic sketch (Mundé).

Pyo-salpinx.—By pyo-salpinx we do not mean the presence of a few drops of pus only in the tube, but the distension of that organ by a considerable amount of purulent fluid, say from one to six ounces or more. Pyo-salpinx is usually the result of a long-continued course of catarrhal, and finally suppurative, inflammation of the mucous lining of the tube, together with obliteration of both orifices and a considerable thickening of the walls of the canal. Little by little the accumulation of pus as the result of recurrent attacks of salpingitis succeeds in dilating the tube until it attains the size of a breakfast sausage, a banana, or a closed fist. By this time usually there has been more or less pelvic peritonitis with exudate and adhesions, and the distended tube rests on the bottom of Douglas's pouch, firmly adherent to its surroundings. The symptoms are those of pelvic peritonitis, each attack being characterized by fresh pain and a rise of temperature; the attacks coming at irregular intervals, although aggravated by the approach of the menstrual period, the patients often being quite free from pain between these exacerbations. While the symptoms are those of recurrent pelvic peritonitis, the examining finger finds not a hard, immovable mass, varying from the size of the fist to that of the adult head, occupying part of the pelvic cavity and extending up into the abdomen, but a tense, tender, fluctuating swelling behind or to one side of the uterus, of an oblong shape, always immovable if there has been pelvic peritonitis—rarely, however, movable. In these respects pyo-salpinx closely resembles the two previous conditions, but there is a history of elevations of temperature, perhaps even now and then a chill, and the suspicion of suppuration is excited by these symptoms. The aspirator at once reveals the presence of pus which may or may not be offensive.

FIG. 324.



Large Pyo-salpinx (Cleveland).

Prognosis.—There is usually not much danger of rupture of the pyo-salpinx into the peritoneal cavity, since peritonitic adhesions render such an accident improbable. It is more likely to burst into the vagina or into the pelvic cellular tissue by ulceration of its most dependent portion. This possibility has led some modern gynecologists to pronounce true pelvic abscess or abscess of the pelvic cellular tissue to be merely a ruptured pyo-salpinx. It is useless to argue this point, since it is perfectly evident that these gentlemen go to the extreme in their anxiety to prove that pelvic peritonitis and salpingitis and oöphoritis are far more common than was formerly supposed (which no one is disposed to doubt)—go out of their way, indeed, to deny the possibility of an inflammation of the pelvic cellular tissue, the existence of which all who are not biassed willingly admit. If not interfered with, a pyo-salpinx may exist for some time without giving rise to any very serious symptoms, but so long as present the patient is liable to a recurrence of pelvic peritonitis, salpingitis, and an increase in the size of the pyo-salpinx at any time, and eventually, it cannot be denied, an upward rupture into the pelvic cavity with fatal peritonitis may result.

Treatment.—When the diagnosis of a purulent accumulation in the tube has been made (and we will here repeat that it is not always possible even with the aspirator to differentiate between an abscess in the ovary and a pyo-salpinx), there is but one question as to the treatment to be employed—namely, the speedy evacuation of the contents of the abscess. There is no difference of opinion upon this question; but as regards the proper means and the proper channel by which the pus should be evacuated there may exist a variety of opinions. The majority of operators, especially those who, so to speak, make a specialty of abdominal section, will undoubtedly reply that the only proper way to treat a pyo-salpinx is to remove the diseased tube bodily by means of an abdominal incision; and probably these gentlemen are right in by far the large majority of cases. Certainly, whenever the pus-tube is movable, and particularly when the appendages of both sides are diseased, even though there may be pus only on one side, the removal of the diseased appendages—that is, both ovaries and tubes—should be performed without delay. If, however, the pus-tube is situated deep in Douglas's pouch, is firmly adherent there, is easily reached through the vagina, and the appendages on the other side are apparently normal, the propriety of opening and draining the abscess through the vagina may well be entertained. It is true, such pus-sacs are usually tedious in closing and the abscess may discharge for months; but we have been very successful in treating a number of cases of this kind through the vagina, keeping a hard-rubber, silver, or glass tube in the abscess-cavity by means of silver-wire stitches which were passed through small openings in the vaginal edge of the tube; by frequent irrigations, and by occasional cauterizations of the pus-cavity with the stick of nitrate of silver we have eventually succeeded in effecting a closure of the abscess. [I was enabled to achieve the same result by applications of iodized phenol in a young girl of sixteen, in whom, to be sure, a secondary attack of pelvic inflammation was produced by these applications, but which resulted in a permanent closure of the tubal abscess.—P. F. M.]

Laparotomy for Diseased and Adherent Tubes.—The technique of this operation differs but little from that already described under Ovariotomy. The chief distinction lies in the fact that the abdominal cavity has not been distended and the abdominal walls are rigid and firm. This renders the first steps of the operation, including the opening of the peritoneal cavity, rather more difficult, and implies extraordinary care on the part of the operator to avoid wounding intestine or omentum which may lie close beneath the peritoneum. Besides, the manipulations in removing the appendages and the introduction of the sutures to close the abdominal wound are rendered more difficult by the rigidity of the abdominal walls. After opening the peritoneal cavity, the incision being made only of sufficient length to enable two fingers to be introduced into the abdomen, these two fingers seek the fundus uteri, and then proceed to map out the appendages and to peel them loose from their attachments if such are present, taking care to avoid undue force or haste, always acting on the principle that it is better to be slow and sure than rapid and uncertain. The appendages will usually be found attached to the bottom of Douglas's pouch and to the posterior fold of the broad ligament. They can be peeled loose by gradually inserting the fingers between the coils of the tube, finding the least resistant spot, and gently sweeping the finger-tips about until the whole organ is detached. If there is pus in the tube, it may rupture upward and its contents escape among the intestines. The appendages should then be peeled loose and brought out of the abdominal incision as rapidly as possible, clamped, tied off, and removed as described under Ovariotomy, and the abdominal cavity then be washed out thoroughly with warm Thiersch's solution. If there is any fear of oozing, or doubt as to whether the abdominal cavity is perfectly clean, a drainage-tube may be introduced, but if we have found the bottom of Douglas's pouch, as explored by repeated sponges on holders, fairly clean and dry, we have usually omitted the drainage-tube and closed the abdominal cavity, and have had no occasion to regret our action. The after-treatment is the same as after ovariotomy.

The proposal has recently been made by several operators, notably Polk, in cases where the adhesions are slight and the tube is easily detached, to endeavor to save the organ and restore it to its healthy condition by opening the fimbriated orifice with a fine probe and passing this through into the uterine cavity, so as to render the tube again permeable. Any secretion contained in the organ should be gently expressed, the organ carefully cleansed, and returned to the abdominal cavity. Polk, we believe, has practised this procedure a number of times, with what ultimate results we are unable to say; that is to say, we are not aware whether the patients were cured and eventually conception took place. Mundé has made the theoretical suggestion[1] to disinfect and distend the canal of the tube after detaching it from its adhesions by injecting a mild solution of bichloride of mercury through it from the fimbriated orifice before dropping it. It will be the task of conservative surgeons to work out this problem, which possibly has a future before it.

The experience of Tait chiefly, as well as that of other less prolific operators, has been that if the appendages of one side are diseased by chronic catarrhal, and mainly by purulent, inflammation, while those of the other side appear as yet healthy, it is still wiser to remove those of the apparently healthy side also, since, in those cases where they have been saved and the attempt made to give the patient an opportunity to conceive, almost invariably the patient has returned within a year or two for disease of those organs, and a second laparotomy was required. Of course if the patient should very anxiously desire children and is willing to take the responsibility of a possible second laparotomy, she should be allowed the privilege of deciding whether both appendages should be removed or not, the case having been properly stated to her before the operation was begun. A second laparotomy, be it mentioned, does not offer, as a rule, any particularly greater dangers than the first, with the possible exception of adhesions of intestines or omentum to the anterior abdominal wall, injury of which organs—this possibility being known—can thus readily be avoided.

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[1] See "A Year's Work in Laparotomy—Forty-five Operations," *Am. Journ. Obstet.*, Jan. and Feb., 1888.

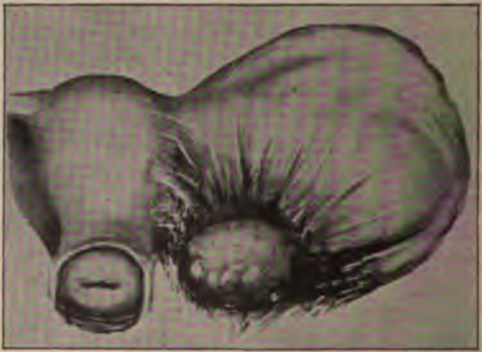
The Indications for Laparotomy in Diseased Appendages depend entirely upon the amount of pain the patient suffers, upon the degree of disease of the appendages as recognized by careful bimanual palpation, and upon the failure of palliative treatment to afford relief. This question must always be left for each individual operator to decide after mature deliberation in each separate case. No hard-and-fast rules can be laid down except such as are based upon the indications just mentioned. We believe that this operation has been performed far too frequently, and that many tubes and ovaries have been sacrificed which could possibly have been saved. It is very tempting to perform laparotomies when they can be accomplished with such comparatively slight risk as is now the case with this operation, and the sufferings of the patients, many of whom are of an intensely hysterical and neurotic type, can be so easily exaggerated and over-estimated that a justifiable indication for the operation is readily found; and for these very reasons would we again warn against the indiscriminate, hasty, and routine performance of this operation.

Results of the Operation.—We have just stated that laparotomy performed for the removal of diseased appendages is accompanied by so little risk that many have undertaken it lightly without, we fear, justifiable reasons. In the hands of Lawson Tait, who has done more to familiarize us with the diseases of the appendages and their operative treatment than any other man, the mortality from this operation has been so slight that we believe he has performed 147 successive operations without a death. In the hands of less dextrous, and perhaps less lucky, operators the mortality has been so trifling that from 50 to 75 operations have been performed successively without a fatal result. The average mortality would probably not be more than from 3 to 5 per cent. Therefore, so far as the immediate results are concerned, nothing better could be desired; but it is our duty to acknowledge to ourselves, and so to inform our patients before the operation, that in a certain proportion of these cases the symptom for which the operation was performed—namely, the pelvic pain—is not relieved, but persists for a number of months, perhaps for years, after the operation, in spite of the fact that the appendages were thoroughly and carefully removed. We cannot give exact figures as to the number of cases in which this is likely to occur, but we recollect enough to justify us in cautioning our readers against promising their patients an entire, immediate, and complete cure as soon as they recover from the operation. Furthermore, the persistence of menstruation for a number of months after the operation is by no means uncommon, and this also should be told the patients to prevent their thinking that the operation has either not been at all or carelessly performed. (For details as to the indications and results of laparotomy for this particular disease we refer to the writings of Tait, Saenger, Wylie, Price, and others.)

Palliative Treatment.—Contrary to the usual order, we have spoken of the radical treatment of diseased appendages first, chiefly because the palliative treatment is so very unsatisfactory, and offers comparatively so little hope of relief, that we have not thought it worth while to spend much time in discussing it. In cases of not too long standing, local counter-irritation by tincture of iodine to the vaginal vault, glycerin tampons, hot douches, iodine, and blisters to the ovarian region of the abdomen; further, brine sitz-baths, and for the relief of pain and occasional interstitial inflammation the mild galvanic current. These are the means which we should advise, practise, and always recommend in every case where they had not already been conscientiously tried for at least several months. In no case would we perform laparotomy where these measures had not been employed first. These remarks, of course, apply entirely to chronic catarrhal salpingitis with thickening and adhesions of the tubes and ovaries, and not to serous, bloody, or purulent accumulations in the tubes.

Displacements.—The tubes may pass with hernial protrusion into the inguinal or crural openings, and in case of inversion of the uterus may descend into the cavity of the displaced organ. It is generally in company with the ovary that the tube leaves its place, but at times it descends alone. Dr. Scholler[1] reports an instance in which, in a child who died twenty days after birth, a tumor was discovered which extended from the inguinal region to the right labium, and contained the Fallopian tube, which was non-adherent. A crural hernia of the tube alone which ended fatally is likewise recorded by M. Bérard.

FIG. 325.



Pyo-salpinx, with adhesions; ovary still distinguishable (Mundé).

Prof. Rokitansky[2] and Dr. Turner of Scotland have both drawn attention to severance of the tube from the ovary by traction from increased weight of the latter or from false membranes. The former cites twelve instances in support of the fact.

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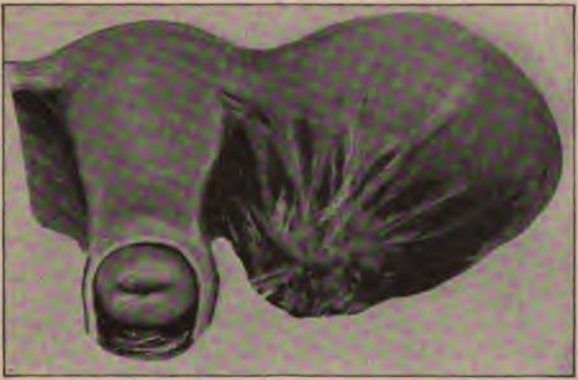
[1] Courty, *op. cit.*

[2] *Sydenham Soc. Year-Book*, 1861.

FIG. 326.



Pyo-salpinx, with oöphoritis and universal adhesions masking the ovary (Mundé).

Other Diseases of the Tubes.—In addition to these diseases the tubes are sometimes affected by tubercle, cancer, and fibrous tumors.

Tuberculosis of the tubes is by no means as uncommon as was formerly supposed, and primarily it is rarely met with, the few cases in which it occurred having been attributed to the direct infection of the genital tract by the tubercular bacilli carried in by the semen of a tubercular man, who perhaps was suffering both from pulmonary tuberculosis and a tuberculous testicle. Usually tuberculosis of the tube is secondary to tubercular disease in other organs of the body, chiefly tubercular peritonitis. The disease manifests itself by a thickening of the tubes, which are filled with caseous material, the walls showing evidence of caseous inflammation. The tubercle bacilli are readily detected in the secretions of the tube. We have seen tuberculosis of the tube in several instances where we operated for tubercular peritonitis, and it was found that the small tumors which were detected in the ovarian regions were the tuberculous tubes and ovaries matted together with the intestines, the peritoneal covering of which was also studded with tubercular deposits.

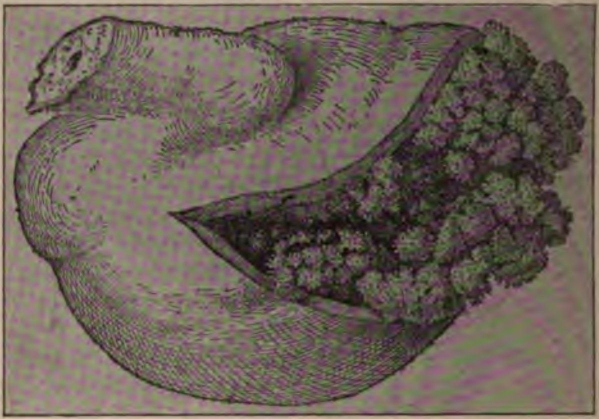
The *diagnosis* of tuberculosis of the tubes is exceedingly difficult. Only when an enlargement and adhesion of the tubes are detected by bimanual palpation, together with tubercular peritonitis or tubercular disease of some other organ of the body, may such a diagnosis be presumptively formed. An examination of the uterine secretion for tubercle bacilli might possibly settle the question.

The *treatment* is unsatisfactory, since opportunity to remove the tubes primarily affected by tuberculosis will scarcely ever be offered, and their removal when complicated by tuberculosis of other organs will of course be merely palliative.

Cancer and fibrous tumors of the tube are rare, and require no special mention in a textbook of this kind.

PAPILLOMA OF THE TUBE.—Doléris[1] reports a probably unique case of this disease occurring in a woman who had suffered from pain in the pelvis and a sero-sanguinolent discharge for a number of months. Examination showed a tumor of the size of a large orange on one side of the uterus. The operation disclosed the growth shown in Fig. 327.

FIG. 327.



Papilloma of Tube (Doléris).

CHAPTER XLVII.

EXTRA-UTERINE PREGNANCY.

IT is evident that to condense into the narrow limits of a short chapter a subject which would require a volume for its extended consideration involves of necessity a superficial review of its essential points only.

It may even be thought by some that this subject is out of place in a work upon gynecology, and that it should have been left for one devoted to obstetrics. Its admission here is proof of the fact that we do not share this feeling. Ectopic gestation, although theoretically falling in the domain of the obstetrician, in reality almost always claims the attention of the gynecologist, from the fact that the existence of pregnancy is in these cases very generally not recognized, the patient being supposed to suffer from some pelvic tumor or obscure uterine or ovarian disorder. It is very frequently necessary to differentiate it from a variety of disorders which will soon be mentioned, and even its treatment involves rather a familiarity with the resources of gynecology than with those of obstetrics.

Definition and Synonyms.—Extra-uterine pregnancy, extra-uterine or ectopic gestation, signifies the fixation and development of the impregnated ovum outside of the uterine cavity.

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[1] *Journ. de Méd. de Paris*, Feb. 23, 1891.

Varieties.—For the physiologist and pathologist there are many varieties of this abnormal gestation; for the gynecologist there are but three. For him the tubo-ovarian, tubo-abdominal, ovarian, and some other varieties are niceties beyond the appreciation of diagnosis, and he is forced to limit himself, as far as practice is concerned, to the classification of all varieties into—1st, tubal; 2d, interstitial; and 3d, abdominal pregnancies. These by rational and physical signs he may differentiate from each other, and in certain cases base the propriety of surgical interference upon his conclusions. These, and these only, then, are the varieties which we shall consider in this chapter.

Tubal pregnancy, the most dangerous of all varieties of extra-uterine gestation, consists in the arrest of the impregnated ovum in the Fallopian tube and its development there. It may be that instead of being absolutely in the tube the fructified ovum may develop just where the fimbriated end of the tube clasps the ovary.

Interstitial pregnancy consists in an advance of the ovum through the tube until it begins to pass through the uterine wall. Then, an arrest taking place before the ovum enters the uterus, it attaches itself, distends the parenchyma of the uterus to make its nidus, and causes it to protrude partly toward the uterine cavity, partly toward the abdominal.

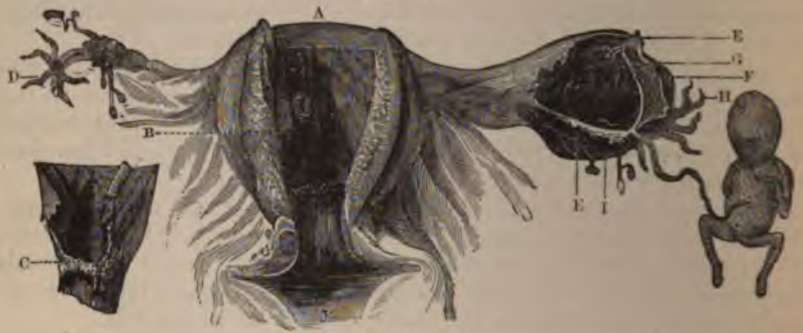
In abdominal pregnancy one of two things occurs: either the tube holding the impregnated ovum in its grasp breaks away from its ovarian attachment, falls into the abdominal cavity, and remains there, while the ovum, casting out tentacula, attaches itself to the peritoneum and grows; or, as some suppose possible, the impregnated egg falls out of the grasp of the tube, and, getting its nourishment from the peritoneum, develops independently of the lining membrane of the uterus which extends throughout the tubes.

Etiology.—It is a fact universally accepted that in the human female, as in the lower order of animals, impregnation of the ovule often occurs at or near the ovary. In some cases, by a stricture in the tube due to lessening of its calibre by inflammation, the development of a little tumor, or contraction of lymph poured out by pelvic peritonitis, an obstruction is offered to the progress of the ovum toward the uterus. In contact with a mucous membrane closely resembling that of the uterus, it at once accommodates itself to its vicarious quarters, attaches itself, forms a placenta, and steadily grows. There are many points in pathology concerning which no one has a right to an opinion who has not made researches of a more or less personal character in regard to them. The pathology of extra-uterine pregnancy is one of them, and, although our experience in reference to this condition is quite large, as we shall soon show, we express ourselves upon it with great hesitation.

Although extra-uterine gestation has been divided by pathologists into abdominal, tubal, ovarian, interstitial, tubo-abdominal, and tubo-ovarian, it seems highly improbable that the ovum at the moment of its impregnation could attach itself to any other tissue than the lining membrane of the uterus, which is so especially constructed to accommodate it. Once having undergone development in this connection, however, it rapidly invades adjoining structures, the omentum, peritoneum, etc., and forces them to nourish it.

Pathology.—Should the arrest of the ovum have occurred in one of the tubes, it develops rapidly and endeavors to furnish a uterus for the growing child. But the muscular structure of the tubes, being scanty compared with that of the uterus, although it develops to accommodate its contents, gradually grows thinner and thinner under distension until, toward the end of the first, second, or third month, it usually ruptures, and the contents of the ovum, as well as much blood escaping from the ruptured vessels of the tube, escape into the peritoneal cavity.

FIG. 328.



Tubal Pregnancy.

A, Uterus laid open on the anterior surface; B, part of the *decidua* still adherent to the right uterine cornu; C, decidua, nearly entire, expelled before death; D, right tube and ovary, normal; E, E, margins of artificial opening in the left tube; F, umbilical cord; G, placenta; H, pavilion of the left tube; I, vascular plexus, ramifying over the tubal covering of cyst, from which the hemorrhage occurs on its rupture; J, vagina.

A true hematocele is thus created, the patient generally becoming collapsed and dying, and very rarely escaping by absorption of the blood and by encapsulation or discharge of the fœtus. Veit[1] declares that about one-fifth of all cases of hematocele are due to the rupture of tubal pregnancies, and that recoveries occur under these circumstances much more commonly than is generally supposed. We do not agree with him as to the frequency of this cause of hematocele, but we are quite sure that we have seen it thus produced, and have seen recovery follow. These are the cases of hematocele which are classed by Barnes under the name of "cataclysmic." As a rule, the violence of their onset entitles them to that name, but it is highly probable that some of those occurring at early periods of gestation develop with less violent and overwhelming symptoms.

Hecker reports 45 cases of tubal pregnancy: in 26 cases rupture occurred in the first month, in 11 cases in the third month, in 7 cases in the fourth, and once in the fifth month. Spiegelberg[2] reports a case of an ovum advancing to maturity in the tube.

Interstitial pregnancy is much less frequent and less dangerous than the variety just mentioned. It is much more likely to advance to full term, and while it may produce death by rupture and discharge into the peritoneum, it may, as in Thomas's fourteenth case and in one observed by Mundé, discharge into the uterus and be expelled through the natural passages. Similar cases are reported by Doran, Polk, Hicks, Poppel, Monteil, Pows, and Parkes. Dr. Lenox Hodge once succeeded in recognizing the existence of such a case at full term, cut through the layer of parenchyma which shut the fœtus off from the uterus, and conducted the case to a successful issue.

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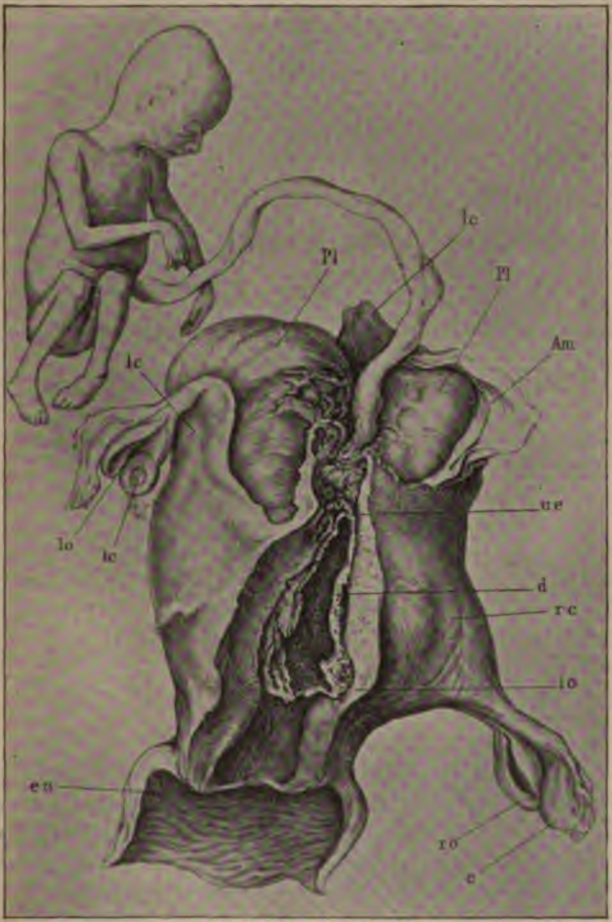
[1] *Deutsche Zeit. für Prakt. Med.*, No. 49, 1878.

[2] *Arch. f. Gyn.*, Bd. i. p. 406.

FIG. 329.



Interstitial Pregnancy (Cleveland).

l c, left cornu; *l o*, left ovary and tube; *c l*, corpus luteum of pregnancy in left ovary (erroneously marked *l c* in plate); *Pl*, placenta; *Am*, amnion; *u e*, superior extremity of uterine cavity in left horn; *d*, decidua; *r c*, undeveloped right cornu; *i o*, internal os; *r o*, right ovary; *c*, cyst.

Although not attended by as great dangers as attach to tubal and interstitial pregnancies, the abdominal variety is a most serious aberration from normal gestation and one which commonly destroys life. In the first two forms the rapidly-developing ovum is imprisoned in tissues which are inapt for great distension, and which rupture under its influence. In the third the fœtal ball has at its disposal for expansion and growth the whole peritoneal cavity, the placenta encroaching in its search after nutriment upon the bladder, the omentum, the intestines, and any portion of the peritoneum within its reach. The events of this form of pregnancy are the following: First, the fœtus, unnaturally attached and nourished, may die in the early months of its life, become encysted, and in time be cast off through the rectum, the bladder, or through the abdominal walls. Second, the pregnancy may advance to the end of the ninth month, when, labor coming on, Nature makes a persistent effort to expel the child, but, on account of there being no way of exit, fails, and the child, with its envelopes, is retained, and, becoming encysted, remains in its nidus for years, creating no disturbance by its presence. Third, the child, shut up in its unopened shell, acts as a foreign body, creates suppurative action in its envelopes, and becomes surrounded with pus in place of liquor amnii. Or, the liquor amnii being absorbed, the fœtal bones become closely hugged by the walls of the cavity which contains them, and act as an intense irritant, which sets up formation of pus, and in this way leads to hectic fever from absorption of septic material.

Hecker found that out of 132 cases of abdominal pregnancy, 76 terminated in recovery. Recovery took place in 28 cases after expulsion of fœtus *per anum*, in 17 cases after formation of lithopædion, in 15 cases after elimination through the abdominal wall, in 11 cases after laparotomy, in 3 cases following vaginal section, in 2 cases from undefined causes. Death followed from septic infection in 18 cases, peritonitis in 12 cases, operations in 12 cases, rupture and hemorrhage in 7 cases, fecal vomiting in 2 cases, dropsy in 1 case, cause not defined in 4 cases.

Causes of Death.—The causes of death in the various forms of extra-uterine pregnancy may thus be presented:

Hemorrhage;
Septicæmia;
Peritonitis;
Perforation of important viscera by bone.

Symptoms.—The suspicion of extra-uterine pregnancy is usually created in one of the following ways: 1st. A woman who has passed over one, two, or three menstrual epochs is suddenly seized with the symptoms of hematocele, agonizing pelvic pain, faintness, coldness of extremities, bathing of face with cold sweat, rapid and feeble heart-action, and nausea and retching. She dies of anæmia from internal hemorrhage, of peritonitis, or of septicæmia; or she gets well, the diagnosis of pregnancy is regarded as a mistake, and she is said to have recovered from hematocele which was the result of temporary suppression of menstruation.

2d. A woman who supposes herself to be pregnant becomes alarmed by the development of one, two, or three sets of abnormal symptoms: (*a*) the occurrence of irregular, immoderate, sudden, and excessive gushes of blood; (*b*) the rapid and disproportionate enlargement of the hypogastrium; or (*c*) the manifestation of a dull, grinding pain, fixed in one iliac fossa or extending thence down the thighs, and, as time passes, becoming markedly paroxysmal and spasmodic.

Suspicion is thus excited, not of the existence of this vice of gestation, but of something being wrong, and a careful examination by rational and physical signs is instituted. Should such examination be made after rupture of the vicarious uterus and escape of its contents into the peritoneal cavity, the ordinary physical signs of hematocele will be detected, and to their enumeration in the chapter devoted to that subject the reader is referred.

Physical Signs.—Besides the symptoms mentioned pointing to the advisability of a physical examination, the uterus is usually found enlarged, lifted up in the pelvis, and pressed forward or laterally by a tumor which exists posterior to it or on one side. This tumor is found to be nearly immovable, very slightly sensitive upon pressure, and marked by a peculiar degree of hyperæmia, which gives, to an exaggerated degree, the violet hue of gestation to the vagina. It is marked by a very rapid growth, so that a week's watching will show a decided increase in its dimensions.

The tumor alone would not furnish sufficient grounds upon which to found a diagnosis of ectopic gestation, but a rapidly-growing pelvic tumor accompanied (*a*) by the gastric and mammary symptoms of pregnancy, (*b*) by cessation of menstruation, (*c*) by enlargement of the uterus, (*d*) by the purple hue of the vagina, and (*e*) by the detection of ballottement in the tumor, would do so.

Differentiation.—The conditions with which extra-uterine gestation is most likely to be confounded are the following:

Uterine fibroma or fibro-cyst;
Cyst of ovary or broad ligament;
Hematocele;
Double or bicorned uterus, with impregnation of one side;
Normal pregnancy with retroflexion;
Pelvic abscess.

The uterus is in these cases lined by decidua, and it is almost as much enlarged as in normal pregnancy. Before any decision is arrived at it is often wise to dilate the cervical canal with tents, so that the finger may be introduced to the fundus. By this measure normal pregnancy, if it exist, is interfered with, but the exigency requiring immediate diagnosis is so great that this disadvantage must be accepted.

Dilatation of the cervical canal having served to exclude normal pregnancy, while all the symptoms of pregnancy exist with marked enlargement and softening of the uterus, and with the presence of a suspicious tumor in the pelvis, the probabilities in favor of extra-uterine fœtation become strengthened. Still, the differentiation of this from the other conditions mentioned remains to be established, and it is often very difficult. It is only by the most careful consideration, patient research, and judicious delay that it can usually be accomplished. While these are being exercised rupture of an extra-uterine fœtal nest may occur, and a fatal issue be the consequence.

In some cases, ballottement, clear and distinct as that which is gotten in normal pregnancy, lends us its aid and makes diagnosis certain; in others the aspirator clears up the case; while in others still—where, for example, the question lies between a cyst of the broad ligament and extra-uterine pregnancy—cutting into the sac by means of the incandescent knife will combine diagnosis and treatment in a most satisfactory manner.

[Let me illustrate the difficulties and methods of diagnosis under these circumstances by the relation of three cases:

Case 1.—Mrs. A—— suddenly ceased menstruating, and for three months suffered from nausea and vomiting, and pelvic pain extending down one thigh, and became so enfeebled and emaciated that she could not stand without support. She came to me from Peekskill, and upon examination I found the uterus elevated and pushed to one side by a fluctuating tumor in one iliac fossa. Drs. Fordyce Barker and Noeggerath saw her in consultation with me, and we could not decide whether it was a case of amenorrhœa with cyst of the broad ligament or tubal pregnancy. Immediate action was necessary, and I cut through the vaginal walls with Paquelin's thermo-cautery, and found the former condition existing.

Case 2.—Mrs. B—— was brought to Dr. Marion Sims and myself to decide as to the cause of irregular menses, with violent pain in left iliac fossa. Physical examination showed uterus pushed upward and laterally by a tumor attached to its left horn. The question lay between interstitial pregnancy and inflammatory product in left broad ligament. To decide it we fully dilated the uterus by tents, introduced the finger fully to the fundus, and found the latter condition to exist.

Case 3.—Mrs. C—— consulted me on account of a soft, fluctuating tumor posterior to the uterus, accompanied by cessation of menstruation. I was doubtful whether it was a fixed ovarian cyst, a hematoma, or an abdominal pregnancy. Her symptoms were so urgent that I dared not delay for time to solve the question, so I passed through the mass a strong interrupted current, which would have killed a fœtus had one existed. But it proved to be a hematoma, and was subsequently discharged through the rectum.—T. G. T.]

The question of diagnosis being a very momentous one, it is generally advisable to settle it by crucial tests which are not attended by great danger if the case be not one of pregnancy, and might prove curative if it were so.

Very often we hear of physicians being blamed on account of failure of diagnosis in those cases which suddenly die from rupture. Every medical man who countenances such a charge demonstrates his want of experience or his want of professional loyalty by so doing. Very often there is nothing in these terrible cases to excite suspicion; very generally nothing to decide us positively even when suspicion is excited.

Symptoms of Approaching Rupture.—The part containing the fœtus and constituting a vicarious uterus begins to contract, and miniature uterine efforts show themselves in increasing severity; a bloody flow takes place from the cervix, and very commonly a small piece of deciduous membrane is expelled. These symptoms will very probably be supposed to point to abortion, and the case is usually allowed to proceed until the suddenly developed symptoms of rupture of the sac serve to open the eyes of the practitioner to the truth, or at least excite in his mind a strong suspicion of it.

Recognition of the Varieties.—Nothing is easier in a written description or in the lecture-room than to point out the means of differentiating the three great varieties of ectopic gestation—abdominal, interstitial, and tubal. Nothing is more difficult, as every man of large experience in this difficulty will agree, than to do this at the bedside. In general terms, it may be said that the interstitial form is very rare, that the tumor consists of an irregular enlargement of the uterine body, and that the tumor moves with the uterus while at the same time this organ is empty; that tubal pregnancy gives an enlargement at the side of the uterus, yields ballottement more generally than the other forms, and is marked by a tumor somewhat separated from the uterus, and which does not decidedly move with it; and that abdominal pregnancy is generally detected late, at a period when the rolling of the child's body in the abdomen can be detected, while at the same time the uterus is found to be empty.

We do not pretend to offer these differences between the varieties as universal and reliable means of differentiation. Indeed, no such means will be offered by any one whose experience is large, for such experience must have taught him that none such exist. We have seen three cases of interstitial pregnancy, and have relied in the description which we have given very largely upon the signs presented in these.

[I mistook a pregnancy in the right horn of a bicorned uterus first for a tubal pregnancy, then, on opening the abdomen, for an interstitial fœtation, and not until the sound was passed toward the left three, and toward the right five, inches was the correct diagnosis made. The woman aborted and recovered.[1]—P. F. M.]

Prognosis.—Whatever be the variety, the period, or the circumstances connected with this vice of gestation, the prognosis is bad. True, a large number of woman escape death, but this fact does not contradict the statement just made. The prognosis is most favorable in abdominal pregnancy when adhesion has occurred from death of the fœtus and subsequent inflammation between the sac-wall and the parietal peritoneum; less favorable where no such adhesion exists and the peritoneal cavity is free in front of the fœtal shell. It is more favorable in interstitial than in tubal pregnancy, and least favorable in the purely tubal variety. In the tubal form it is much less favorable if the fœtus be living than if it be dead. Kiwisch[2] reported 100 cases of extra-uterine pregnancies, with 18 recoveries; Puech, 100 cases of tubal pregnancy, 98 cases of rupture of tube, 2 of rupture of vein of broad ligament, 1 recovery; 199 cases of elimination of fœtus in the ovarian and abdominal form, 146 recoveries. (See Courty, p. 996.)

[As my experience in this condition has been quite large, I report it in full in the subjoined table:[3]

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[1] *Am. Journ. Obst.*, 1890.

[2] Spiegelberg, *Lehrbuch der Geburtshülfe*, 1877, p. 323.

[3] [I have met with a number of additional cases since this table was constructed.—T. G. T.]

No. of case.	With whom seen.	Variety.	Remedial measures adopted.	Termination.
1	Dr. Mouraille.	Tubal.	. . . . . .	Death from rupture.
2	Dr. Henschel.	Tubal.	Aspiration by Dr. Thomas.	Death from septicæmia.
3	Dr. Henschel.	Tubal.	. . . . . .	Death from rupture.
4	Dr. Giberson.	Tubal.	. . . . . .	Death from rupture.
5	Dr. J. L. Brown.	Tubal.	Aspiration by Dr. Thomas.	Death from rupture.
6	Drs. Green and Crane.	Tubal.	Elytrotomy by Dr. Thomas by galvano-caustic knife and delivery of fœtus.	Recovery.
7	Drs. Coates and Barker.	Abdominal.	Laparotomy by Dr. Thomas.	Recovery.
8	Dr. Chas. Young.	Abdominal.	Laparotomy by Dr. Thomas.	Recovery.
9	Dr. J. Hadden.	Abdominal.	Laparotomy by Dr. Thomas.	Recovery.
10	W. J. Walker.	Abdominal.	Discharged by vagina.	Recovery.
11	Olcott.	Abdominal.	Discharged by rectum.	Recovery.
12	Drs. Barker, Fisher, Lusk, and Metcalfe.	Tubal.	. . . . . .	Death from rupture.
13	Dr. Green.	Interstitial.	. . . . . .	Died years afterward from pneumonia.
14	Drs. Emmet and McBurney.	Interstitial.	Life of fœtus destroyed by electric current; fœtus discharged through uterus.	Recovery.
15	Drs. Peaslee and Janvrin.	Abdominal.	Incision by Dr. Peaslee.	Death from septicæmia.
16	Dr. W. Frankel.	Abdominal.	. . . . . .	Still living.
17	Dr. Harrison.	Abdominal.	Electric-current now being used.	Patient living.

Of these 17 cases, 2 were interstitial, and both recovered; 7 were tubal, and 1 only recovered; 8 were abdominal, and 5 recovered; while 2 are still doubtful. Out of the 17 cases, 10 recovered and 7 died. This fact, however, must be noted: 2 patients still live, and the diagnosis may be incorrect in their cases, or they may yet die of the condition if the diagnosis be correct. Out of the 17 women thus affected, 9 were submitted to surgical procedures, and out of these 6 recovered and 3 died.—T. G. T.]

Treatment.—In dealing with the treatment of extra-uterine gestation we are possessed by a strong desire to avoid even the appearance of dogmatism. There is none in the whole list of subjects, obstetrical and gynecological, about which so little is absolutely settled and upon which practical men differ so widely. At one extreme stand able and conservative practitioners who appear to favor the position that, as a very general rule, we should stand calmly by with folded arms and accept without effort or resistance the terrible chances of death which attend these cases. At the other we see enthusiastic ones with strong surgical proclivities, who would apparently resort to laparotomy in every case in which diagnosis is possible. On a middle ground, one lying between these extremes, the truly conservative surgeon will find his appropriate position.

Let us in the beginning recognize the fact that, do what we will—remain utterly inactive or use the greatest surgical enterprise—the issue of these unfortunate cases will very likely be bad. And let every surgeon be sure that he does not shirk a dangerous operation because he fears the odium which will probably attach to a fatal result, and which he would avoid if he simply allowed his patient to die without an effort. He who cannot bear unjust censure and endure without complaint an odium which he does not deserve was not born to be a surgeon, one of the greatest functions of whose life this is; and under the grave responsibilities which attach to the conduct of a case of ectopic gestation it is the bounden duty of such an one to place his patient's interests in stronger hands. The statement is true everywhere in surgery, but nowhere is its truth more strikingly apparent than in these cases, that every personal consideration, every private interest, should yield to the good of the patient.

One point which may be regarded as entirely settled in the treatment of extra-uterine pregnancy is this: a secondary operation for discharge of the contents of the fœtal sac is always safer than a primary one. But its antithesis must likewise be recognized—it may become hazardous to discard a primary operation and to expose a patient to the delay involved by waiting for a secondary one. The rule for interference should then be this: Delay is wise so long as it is the offspring of prudence; it is culpable as soon as it becomes the dictate of timidity and indecision.

The only way in which justice can be done to this subject is by supposing certain conditions, differing widely from each other, in which the patient may be seen:

(*a*) The tumor being low in the pelvis, fluctuation distinct, and the diagnosis of extra-uterine pregnancy well established, the life of the fœtus should be destroyed by means as certain and as free from danger as possible. There are three methods by which this may be done: 1st, by passing through the tumor a strong interrupted current, one electrode in the rectum and the other on the most prominent part of the tumor, the judgment of the practitioner being the guide as to the power and duration of the current; 2d, by injecting through the vaginal or abdominal walls, by means of a long and slender hypodermic needle, ten to fifteen drops of Majendie's solution of morphia directly into the sac; and, 3d, by drawing off the liquor amnii by a very small aspirator needle with antiseptic precautions.

1. *Electricity.*—Bachetti was the first in 1853 to treat and arrest a tubal pregnancy by electro-puncture with the faradic current; Braxton Hicks in 1866 employed the faradic current in a case of abdominal pregnancy, then punctured *per vaginam*, the patient dying of internal hemorrhage. Allen of Philadelphia in 1869 was the first in this country to treat a case of extra-uterine (abdominal) pregnancy by this method with success. He was followed by Landis, McBurney, Thomas, Lusk, Bache Emmet, Mundé, Wilson, Janvrin, Garrigues, and a number of others, one of the last of whom, A. Brothers of New York, collected all the reported cases and published them in an excellent paper printed in the *Am. Journal of Obstetrics* for May, 1888. Of the 43 cases in

Brothers' list, 2 were treated by electro-puncture, 21 by faradism, 16 by galvanism, 2 by both currents, and 1 by franklinism; 1 case is unclassified. Only 1 case terminated fatally, that of Janvrin, in which the electricity was employed too late, rupture of an artery in the sac-wall having occurred nine days previously. Therefore, neither in this nor Hicks's case can the death really be attributed to the electricity. In none of the cases, so far as could be learned, did suppuration of the ovisac occur after the fœtus was killed by the electric current, but the sac gradually shrivelled and gave rise to no further disturbance.

The one great objection to this treatment of ectopic gestation in the early months (up to four months) is the uncertainty of diagnosis. Some extreme authors even go so far as to assert that the diagnosis of an unruptured tubal pregnancy in the early months has never been made. This is manifestly incorrect, and does not merit discussion. Laparotomy specialists favor that operation in all cases of tubal pregnancy when the ovisac and its contents can be entirely removed. Of course the electric current (preferably the faradic) is applicable only to cases where absolutely no sign of impending rupture is present. One pole is placed against the dilated tube, either in the vagina or rectum, and a series of sharp shocks are passed through, several sittings being given until the sac ceases growing.

2. *Puncture and Injection of the Sac.*—This method has now been entirely abandoned, although it was performed in a number of instances with good results—viz. twice by Morton, and once each by Greenhalgh, Stoltz, and Koeberlé. [I have resorted to this plan twice, and lost both patients. One died of septicæmia, the other of hemorrhage into the sac and rupture. Dr. Routh has reported a case which ended fatally after the same operation as my second one did.—T. G. T.]

3. *Aspiration of the Amniotic Fluid* has now also given way to the more certain and less dangerous methods of electricity and laparotomy.

(*b*) The pregnancy being to all appearances one of the tubal variety, and immediate action being demanded by severity of symptoms, the operation of laparotomy should at once be performed, the broad and ovarian ligaments and the Fallopian tube be included as a pedicle in a ligature, and the whole mass be removed.

The one great danger to be feared from the growth of a tubal or interstitial pregnancy is the rupture of the tube or uterine horn, and a violent hemorrhage into the peritoneal cavity, which may at once prove fatal, or, recurring once or oftener, speedily carry off the patient. The signs of impending rupture are paroxysmal attacks of pain of a darting, tearing nature in one or the other ovarian region, followed by temporary nausea and faintness. At what period in the gestation the rupture may happen can never be foreseen, since it has occurred at as early a period as four weeks after impregnation, and has been deferred in a few rare instances to the fourth and fifth months. The usual period at which the tube gives way is between the sixth and tenth weeks. If there is the slightest suspicion of the existence of a tubal pregnancy, based on both rational and physical signs, we should on no account wait until symptoms of impending rupture have made their appearance, or indeed until that accident has actually occurred, which is liable to be the case at any time, day or night. But we should at once proceed to arrest the growth of the ovum by electricity if we happen to be a believer in that practice, or remove the ovisac and its contents by laparotomy if we doubt the efficacy of the electrical treatment. The opening of the ovisac with the Paquelin knife, which we formerly practised and recommended, has now been abandoned by us in favor of the above methods.

(*c*) Should the pregnancy unquestionably be abdominal, as proved by its advance beyond the period ordinarily possible for tubal distension, and by the comparatively small size of the uterus, it should not be interfered with until the completion of the full term. At that time an effort at labor usually occurs and gives a signal for action. Should this most fortunate event occur, the crowning triumph of obstetric surgery may be reached in the delivery of a living child from a living woman at full term, as was first done by Jessop of Leeds in a case reported to the London Obstetrical Society a few years ago, and has since been accomplished by Breisky, Eastman, Braun, Tait (3 operations, 3 children, and 2 mothers living), and others. According to statistics of Harris (*Am. Journ. Med. Sci.*, Sept., 1888) of 30 cases of primary laparotomy with living fœtus near term, up to 1880 there were 20 cases, with but 1 success for the mother and 10 for the child. From 1880 to 1888, however, there were 10 cases with 4 recoveries of the mother and 6 of the child; hence with increasing experience and dexterity the results are visibly improving in this formerly almost desperate operation.

In those cases where the head passes downward into the pelvis it sometimes becomes possible to cut through the vaginal wall, seize the presenting part by the obstetric forceps, and deliver a living child from a woman, only slightly endangered by the operation, almost *per vias naturales*. In the year 1816, Dr. John King, a country practitioner residing upon Edisto Island, on the coast of South Carolina, met with just such a case as we have pictured, and, being both a bold and original man, he followed the course to which we have alluded, with the result of saving mother and child. This case will be found published in the *Med. Repository*, 1817.

(*d*) Should delivery at full term not be accomplished, a lithopædion or petrified infant may result and be retained for many years; suppurative action may occur in the fœtal envelopes, and laparotomy be subsequently resorted to as a secondary operation; or, the liquor amnii being absorbed, the bones of the child may remain clasped by the fœtal envelopes and produce dangerous inflammation and ulceration. Under these circumstances it requires a great deal of consideration as to the proper course to pursue, whether to interfere or to leave matters to nature. Even if it be recognized that interference will surely become necessary, the question arises as to the time at which it should be practised. In the other varieties of extra-uterine pregnancy the continued progress of gestation exposes the woman to constant and steadily increasing danger of sudden death. In the abdominal form it not only does not do this, but it is, as has been stated, often the wise course to allow the process to continue until the child arrives at full development.

Let us suppose that either before or after full term of gestation the child has died, and it is pretty certain that the woman carries her dead offspring within the peritoneal cavity. Is it wise on this account at once to interfere by surgical means? We think not. One of the greatest dangers attaching to interference consists in hemorrhage. The longer time that the placenta remains attached after fœtal death the more certain is it to become atrophied and consequently less vascular. Another great danger consists in septicæmia. The more thoroughly the fœtal envelopes become disgorged and atrophic from loss of function, the less likely is this dangerous complication to develop. Judicious delay and cautious waiting for symptoms indicative of approaching trouble are, then, in my opinion, decidedly advisable.

But such delay, such waiting, are by no means to be carried so far that symptoms of septic absorption shall occur. Non-interference carried as far as this is not less to be deprecated than a rashness which results in intemperate and premature resort to operation.

A fœtus remaining in the abdominal cavity long after the full term of gestation having lost its life, and being surrounded by intestines after absorption of the liquor amnii or by a purulent fluid which has replaced it, is always an element of great danger which must become more and more aggravated as time passes. Its removal should be regarded only as a question of time, not of propriety. It is true that instances are on record where such contents have remained in the bodies of unfortunate women for thirty and forty years, but such cases are rare exceptions to the rule, and the impropriety of leaving these women for the remainder of their lives in such peril could be tolerated only in the dark days of abdominal surgery.

[I have operated six times for extra-uterine pregnancy, but never have I done so without good reason for believing that delay would be far more dangerous than immediate interference. Out of the six operations, four have saved lives which were in imminent peril. Nevertheless, I am willing to accept as a rule the precept that operative procedure in the abdominal form of extra-uterine pregnancy had better, if possible, be delayed until Nature points to the channel of extrusion which she selects. The most dangerous of men, however, are those who implicitly, unthinkingly, obey rules. The bold and wise surgeon is he who keeps the rule for general guidance, breaking it unhesitatingly when an exceptional indication demands such a course. —T. G. T.]

No fixed rule can apply to all these cases. The following may guide the practitioner in general, he modifying them to suit the varying indications which may present themselves:

Before full term, should the child developing in the peritoneal cavity be alive, its growth may be carefully watched, and the end of the ninth month be waited for in hope of delivering at that time, either by laparotomy or elytrotomy, a living child from a living woman.

Should the child have died early in the pregnancy, delay in interference is advisable, but this should not be carried to the development of septicæmia, either acute or chronic.

Should the full term be passed and the child be still imprisoned in its unnatural resting-place, the rule should be to wait for evidences of constitutional disorder on the one hand, and to meet its development promptly and decisively by succor on the other.

The most favorable condition for laparotomy is when the fœtal sac is adherent to the abdominal walls, and opening into the peritoneal cavity becomes unnecessary. When the sac is not thus adherent, its walls should be stitched to those of the abdomen, the peritoneum be shut off, and antiseptic injections practised.

If the pregnancy be interstitial, the uterine cavity should be dilated, so that palpation from within it can be practised and the possibility of incision considered.

We have already indicated the course to be pursued when the rupture of the sac of an interstitial or tubal pregnancy is imminent or has already taken place. In either case the only wise and safe course is to open the abdominal cavity as rapidly as possible and remove the rupturing or already ruptured tube, securely ligating its uterine attachment. The abdominal cavity should then be thoroughly cleansed of coagula by means of warm boiled water or Thiersch's solution poured into it from a pitcher, Douglas's pouch be carefully sponged, and the wound closed with or without a drainage-tube as the judgment of the operator may decide. At the present day the indications for this procedure are so clear and universally accepted that no serious objection can be made to them; but this was not always the case. It is only within the last few years that the profession has agreed to accept this view of the matter. The credit for first advocating this bold and radical policy is due to Dr. Stephen Rogers of this city, who in 1867 wrote a monograph strongly recommending laparotomy in these cases for the control of hemorrhage. The only objections to this practice are —first, the difficulty of making the diagnosis; and, second, the late hour at which the operator is frequently called to such cases. As regards the first objection, the symptoms of severe intra-peritoneal hemorrhage, whether they are due to a ruptured tubal pregnancy or to the rupture of some other intra-abdominal vessel from another cause, should call for the exercise of the universally accepted surgical principle—namely, in case of hemorrhage to expose the bleeding vessel and to ligate it. Therefore, no matter whether the hemorrhage was due to a ruptured tube or to the rupture of some other vessel, laparotomy should be at once performed and the bleeding spot brought to view and permanently secured. It is safe to say, however, that in by far the large majority of sudden intra-peritoneal hemorrhages the cause is the rupture of a gravid tube. As regards the second objection, it undoubtedly holds good in a number of cases, but instances have been reported where women who were absolutely pulseless and apparently *in articulo mortis* have rallied after laparotomy and ligation of the ruptured tube, and have made a perfectly smooth recovery; therefore, no case should be pronounced too far gone for operation in which even the slightest evidence of life persists.

[In the last edition of this work I stated that in my personal experience of seventeen cases, I had seen but one in which I could have been justified to perform laparotomy for hemorrhage from a ruptured pregnant tube. In that case a lady bled steadily for over forty-eight hours, and although I urged the diagnosis of tubal pregnancy and the propriety of laparotomy very strongly, I was overruled as to both points by a strong consultation. A post-mortem examination showed a fœtus near the fimbriated extremity of one tube surrounded by its liquor amnii. The sac was not ruptured, but one vessel on its circumference was, and from this a fatal flow had occurred. Laparotomy would almost surely have saved the life of this patient. Since then I have come to believe that the possibilities of laparotomy are very much greater in these apparently desperate cases than was formerly my opinion.—T. G. T.]

CHAPTER XLVIII.

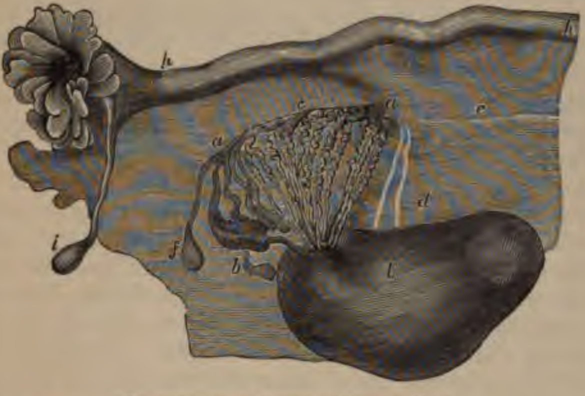
DISEASES OF THE UTERINE LIGAMENTS.

THE uterine ligaments are eight in number—two broad, two round, two utero-vesical, and two utero-recto-sacral. All of these but the round ligaments are composed of folds of peritoneum containing scattered throughout them irregular layers of smooth muscular fibre. They support the uterus from above, prevent it from sinking too low or remaining below its normal altitude in the pelvic cavity, or from assuming either a permanent anterior, posterior, or lateral deviation. As supporters of the uterus they are of the greatest importance, their relaxation resulting in a displacement of that organ in one of the directions mentioned, even though the vaginal walls, peritoneum, and pelvic fascia be intact.

Diseases of the Broad Ligaments.

Anatomy.—Firmly enclosing the fundus and body of the uterus down to the level of the internal os is the peritoneal membrane. Anteriorly in the median line the peritoneum ascends over the fundus of the bladder and is extended upon the anterior abdominal wall. Posteriorly the peritoneum descends very much deeper, in fact down to the roof of the vagina, then passes up on the anterior wall of the rectum, being thrown on either side of the rectum into two sharp folds —the utero-recto-sacral ligaments. Laterally the peritoneum covers the pelvic walls and passes upward into the iliac fossa to join the anterior portion of the membrane on the one hand, and posteriorly to cover the posterior aspect of the abdominal cavity. That portion of the anterior and posterior folds of the peritoneum which extends from the fundus uteri to the ilio-pectineal line is called the broad ligament; in its upper edge runs the Fallopian tube; situated between the two layers, and projecting uncovered by peritoneum through the posterior layer, is the ovary. Situated also between its two layers is an embryonal body consisting of a number of small tubes and cysts, a probable remnant of the Wolffian body, the so-called parovarium or organ of Rosenmüller. The connection between the peritoneum and the body of the uterus is exceedingly firm, but otherwise the layers of the broad ligament are separated by a fair amount of cellular tissue, in consequence of which the peritoneum may be pushed away from its attachment, and pressed upward and inward by tumors which develop between the folds of the broad ligament (intraligamentous ovarian and fibroid tumors, cysts of the broad ligament) or by plastic exudations, effusions of blood, or purulent accumulations. We have seen the peritoneum thus dissected up almost to the region of the kidney, and it is easily understood how extra-peritoneal—that is, intraligamentous—effusions of lymph, blood, or pus may make room for themselves by separating the peritoneum from the pelvic wall, and present on the anterior abdominal wall even as high as the antero-superior spinous process of the ilium. Fibrous tumors of the uterus, ovarian tumors, and cysts of the broad ligaments which have developed in a similar manner have been known to push up the peritoneum so far as to become chiefly abdominal, all the time of course being retro-peritoneal.[1]

FIG. 330.



Parovarium, or Organ of Rosenmüller.
a, *b*, *c*, *d*, *f*, parovarium; *e*, broad ligament; *h h*, tube; *i*, cyst of Morgagni; *l*, ovary.

TUMORS OF THE BROAD LIGAMENT.—The chief form in which tumors of the broad ligament present themselves is as cysts, which develop from the parovarium just referred to, and grow down between the layers of the broad ligament. These cysts usually grow more slowly than ovarian cysts, have a tendency to point downward into the pelvic cavity at first, and only to encroach upon the abdominal cavity as they grow larger. They also do not interfere with the general health of the patient as do ovarian tumors, and give rise to very little discomfort except through the pressure which they may exert on the pelvic organs by their increasing growth. These cysts are always monocysts.

Diagnosis.—The diagnosis will be made chiefly by the slow growth, the absence of cachexia, the deep seat in the pelvis of the tumor, the absence of solid material; by the fact that the cyst usually does not exceed in size that of a pregnant uterus at six months; and finally, by the entirely transparent, limpid character of the fluid removed by the aspirator, which under the microscope shows nothing but a few ciliated epithelia, but no granular matter or corpuscles whatever. Occasionally these cysts grow very large, and one was operated on by Mundé which contained thirty-eight pints of fluid.

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[1] See plate facing p. 473.

Prognosis.—As a rule, unless they should happen to become troublesome on account of their unusual size, these cysts of the broad ligament are not productive of any particular danger or discomfort to the patient. Still, as they produce an abdominal enlargement, as the diagnosis is not always certain, and as even after tapping they are liable to refill, at the present day they are usually operated upon precisely as though they were ordinary ovarian cysts.

Treatment.—Formerly, when the diagnosis of a cyst of the broad ligament was made, it was thought the proper thing to empty it by paracentesis, and to trust to nature that it would not refill. This expectation undoubtedly often came true, but quite as often the reverse was the case, and after repeated tappings it was finally found necessary to remove the cyst. This is usually not very difficult or dangerous, except in one particular—namely, that the cyst, being developed between the layers of the broad ligament, has no pedicle, and in this respect resembles intraligamentous cysts of the ovary, which, it will be remembered, we pronounced to be among the most difficult for operation of all tumors of that organ. If the sac of the parovarian cyst can be enucleated, this should be done, and the cavity remaining may then be closed by deep catgut sutures so introduced as to thoroughly approximate its walls. The broad ligament is then dropped and the abdominal wound closed. A safer plan, and one which we have usually adopted, is—either after enucleating the cyst, or, if this was not possible, without enucleating it—to remove the excess of the sac, including broad ligament and cyst-wall, and sew the remainder with the interrupted suture into the abdominal wound. The sac was then packed with iodoform gauze and allowed to heal by granulation, as already described under Intraligamentous Cysts of the Ovary. We have performed many such operations, and do not remember ever losing a case.

SOLID TUMORS OF THE BROAD LIGAMENT.—These are usually fibroid tumors of the uterus which have grown from the lateral wall of that organ and developed between the layers of the broad ligament, pushing them before them, as already described. This peculiar direction of fibroids of the uterus is fortunately rare. The diagnosis can be made only by the position of the tumor, and if it has grown so large as to warrant its removal by laparotomy, the true relations of the growth will often be recognized only after the abdominal cavity has been opened. The operative removal by laparotomy is rendered exceedingly difficult in consequence of the necessity of splitting the covering of the tumor—which, be it understood, is the broad ligament—and peeling the tumor bodily out of its bed, during which manœuvre very severe and not easily to be arrested hemorrhage may take place. Usually the sac enclosing the growth is to be sewed to the abdominal incision and packed with iodoform gauze, as already mentioned. Occasionally such intraligamentous tumors of the uterus may be susceptible of removal through the vaginal vault.

Effusions of plastic lymph, of blood, and accumulations of pus between the layers of the broad ligament have already been sufficiently described under the respective heads of Pelvic Cellulitis, Pelvic Hematoma, and Pelvic Abscess, to which chapters the reader is referred.

Diseases of the Utero-vesical and Utero-recto-sacral Ligaments.

The diseases chiefly affecting these two sets of ligaments are relaxation and contraction. The relaxation is due to the stretching produced by a subinvolution following successive pregnancies and childbirths. The contractions result from peritonitis, usually of the pelvic variety, and frequently entirely unsuspected by the patient. The retro-uterine ligaments are more frequently affected by inflammatory contractions than the ante-uterine, and the cervix is very often found drawn backward and attached more or less immovably to the anterior surface of the rectum. It should be added that inflammatory contraction of the broad ligaments may also take place and cause fixation of the cervix toward one side or the other, with a corresponding inclination of the fundus in the opposite direction.

The *diagnosis* of these conditions is very easily made, since in relaxation of the ligaments the uterus becomes abnormally movable, and sinks with equal facility in every direction toward which either the finger or the position of the patient induces it to fall, and in contraction the normal mobility of the organ is more or less limited according to the ligament which is shortened and the amount of its contraction.

Treatment.—For relaxation of the uterine ligaments very little can be done: support from below by means of astringent vaginal tampons until involution has taken place if the case be one of recent parturition; the faradic current applied directly to the relaxed ligaments; massage of the uterus and its adnexa as recently advocated by Thure Brandt, Schultz, Profanter, and others; and possibly ventro-fixation as a radical measure,—are the chief means of treatment. For contracted ligaments the systematic firm tamponing of the vagina with absorbent cotton, or, what is better, prepared sheep's wool, in order to gradually effect a dilatation of the vaginal vault, and thereby a stretching of the contracted ligaments; frequent massage and manipulation of the uterus so as to stretch the ligaments; and perhaps carefully selected pessaries,—may eventually produce the desired result.

Diseases of the Round Ligaments.

There are but few diseased conditions of the round ligaments to be mentioned. Duncan, Kleinwächter, and Winckel report each a case of intra-peritoneal fibro-myoma of the round ligament. Hydrocele of the ligament has also been observed, which is a defect of development. Adhesion of the round ligament to the canal of Nuck is not uncommon, and forms a decided obstacle to the success of Alexander's operation for shortening the ligament in retro-displacement of the uterus. Lengthening and relaxation of the round ligaments is commonly observed as a result of backward displacement of the uterus, and is not in itself a disease.

The treatment of these few morbid conditions of the round ligaments is as simple as the disease. A tumor, if it gives rise to symptoms, should be removed, likewise a hydrocele, or at least freely incised and allowed to granulate. Relaxation of the round ligaments is treated by opening the canal and drawing them out and cutting off the excess; the remainder is sewed into the canal. This operation, however, is never performed except for the indication of permanently replacing a retro-displaced uterus.

CHAPTER XLIX.

STERILITY.

Definition and Synonyms.—This term, which is derived from *στερεος*, "barren," and implies an incapacity for conception, is synonymously entitled barrenness and infecundity.

History.—Throughout medical literature, from the earliest periods to the present, it has attracted special attention, and been the subject of dissertations by all authors who have touched upon the affections peculiar to females. The frequent reference made to it by biblical writers as a reproach to women is too well known to require special mention.

Causes.—To comprehend the pathology of sterility the physiology of conception must be clearly understood. In the act of coition the male organ, being introduced into the vagina, projects into and against the cervix a fluid consisting of a thick, watery portion holding in suspension large numbers of ciliated cells which have power of moving by ciliary action. The bulk of this fluid pours down into the vagina, but many of the cells which it contains pass upward into the body of the uterus and through the Fallopian tubes as far as the ovaries. Should they come in contact with an ovule, impregnation may take place in the ovaries, Fallopian tubes, or uterus. When the impregnated ovule attaches itself to the uterus, the mucous membrane of this organ undergoes exuberant development and throws around it an envelope called the decidua reflexa. Further than this the process does not concern us, for conception has then followed impregnation, fixation of the impregnated ovum having occurred.

These facts being kept in mind, it becomes evident that a variety of influences may interfere with the performance of this delicate and subtle process. For its accomplishment four things are necessary as far as the woman is concerned—

1st. The possibility of the entrance of seminal fluid into the uterus;

2d. The possibility of the production of a healthy ovule;

3d. The possibility of the entrance of an ovule into the uterus;

4th. The absence of influences *in utero* destructive to the vitality of the semen and preventive of fixation of the ovum upon the uterine wall.

Should these four conditions exist, no woman will be sterile. She may not bear children, but the incapacity may attach to the male, and not to her; or, having conceived, she may have suffered from consecutive abortions, which have been mistaken for attacks of menorrhagia.

The special causes of sterility, or those interfering with these conditions, may be thus presented:

1st. *Causes preventing entrance of semen into the uterus:*
- Absence of the uterus or vagina;
- Obturator hymen;
- Vaginismus;
- Atresia vaginæ;
- Occlusion of cervical canal;
- Conical shape of cervix;
- Cervical endometritis;
- Polypi or fibroids;
- Displacements;
- Very small os internum or externum.

2d. *Causes preventing the production of a healthy ovule:*
- Chronic ovaritis;
- Cystic disease of both ovaries;
- Cellulitis or peritonitis;
- Absence of ovaries.

3d. *Causes preventing passage of ovule into the uterus:*
- Stricture or obliteration of Fallopian tubes;
- Absence of Fallopian tubes;
- Detachments and displacements of Fallopian tubes.

4th. *Causes destroying vitality of semen or preventing fixation of impregnated ovum:*
- Corporeal or cervical endometritis;
- Membranous dysmenorrhœa;
- Menorrhagia or metrorrhagia;
- Abnormal growths;
- Areolar hyperplasia.

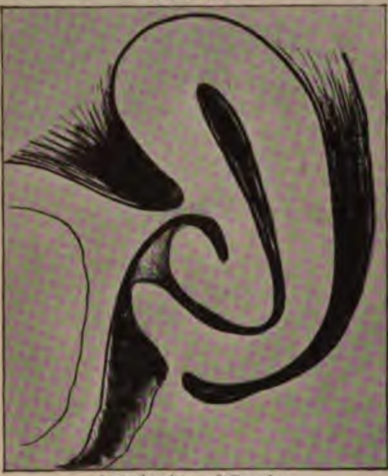
5th. *Causes producing non-retention of semen in the vagina:*
- Laceration of perineum;
- Rectocele;
- Prolapsus uteri et vaginæ.

The mode of action of most of these causes is so self-evident as to make anything more than their mention unnecessary. Some of them, however, require special explanation.

Vaginismus is an appellation which has been given of late years to a hyperæsthetic state of the ostium vaginæ which results in spasm of its sphincter. This interferes with the entrance of the male organ, and consequently of seminal fluid into the vaginal canal; indeed, in aggravated cases it entirely precludes sexual approaches. The affection is by no means rare, and is a fruitful source of sterility.

An abnormal shape of the cervix has been pointed out by Dr. Sims as a frequent cause of infecundity. If this part be too long, so as to curl or bend upon itself, it is evident that it may not admit seminal fluid through its canal. But even a slighter degree of elongation, in which the cervix has a conical shape, has been observed to be frequently followed by that condition.

FIG. 331.



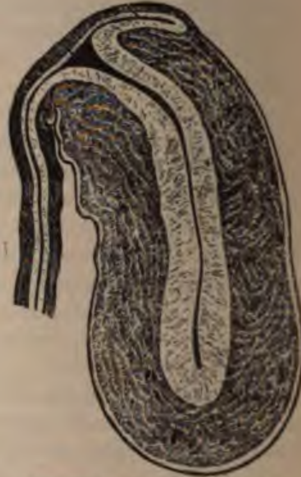
Anteflexion of Cervix.

Endometritis, whether it be cervical or corporeal, fills the uterine canal with a thick, tenacious mucus which often prevents the entrance of seminal fluid or destroys its vitality.

Flexions of the uterus, by producing bending of the cervical canal, and versions, by pressing the os against one wall of the vagina so as to close it as if by a valve, may entirely obstruct the passage to the uterus.

Obliteration and displacement of the tubes frequently result from pelvic peritonitis, and thus that affection often entails sterility of the most irremediable character. (See the various illustrations of tubal disease in the chapter on that subject.) The second stage of the disease consists in effusion of lymph, which in time undergoes contraction and either closes these canals or draws them out of place.

FIG. 332.



Extreme Degree of Anteversion (Beigel).

Membranous dysmenorrhœa, or rather the tendency to exfoliation of uterine mucous membrane which characterizes it, so alters the uterine surface as to render it inapt for the fixation of the ovum.

Menorrhagia and metrorrhagia may result in the washing away of the ovum after impregnation and before fixation. The normal menstrual hemorrhage occurs before the entrance of the ovule into the uterus. If it be excessive and prolonged, it may remove the ovule entirely, and in the same way metrorrhagia may remove the impregnated ovum. An abortion does not occur under these circumstances, for, although impregnation may have taken place, conception has not done so.

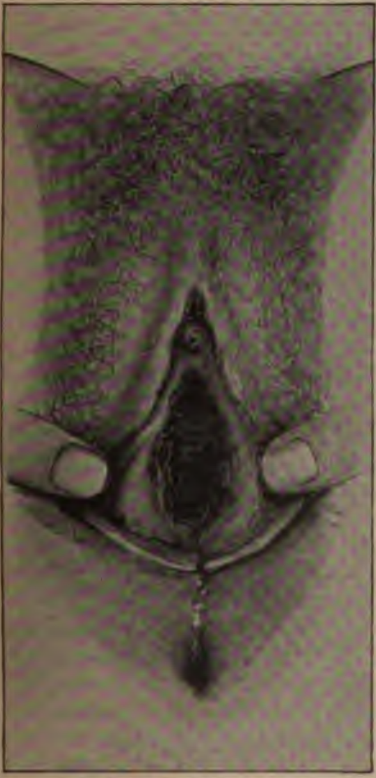
Abnormal growths of any form which fill the uterine cavity—as, for example, fibroids, polypi, hydatids, or moles—may so interfere with the attachment of the ovum to the uterus as to prevent conception even when impregnation has occurred.

Laceration of the perineum of the deeper degrees, with or without prolapse of the posterior vaginal wall and uterus, may, by permitting the semen to flow out of the vagina immediately on the withdrawal of the male organ, or when the woman sits or stands up, be a cause of sterility.

Although it is impossible to give positive proof of the fact that serious chronic disease of the ovaries results in a blighting influence upon the ovule, such a conclusion is rendered highly probable by the results of experience in such cases. Such a result is often found to attend chronic oöphoritis, general pelvic peritonitis or cellulitis, and double cystic disease of the ovaries.

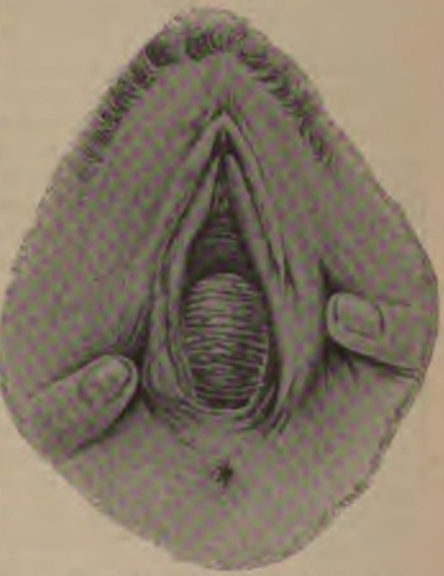
Some of the causes here enumerated are much more frequent than others. We would enumerate the most common causes in the order of their frequency in the following sequence: First, glandular cervical endometritis; second, areolar hyperplasia, the result of subinvolution of the uterus; third, conoid cervix, with contracted os; fourth, flexion and version of the uterus; fifth, contraction of os externum; sixth, fibroids, interstitial or submucous; seventh, menorrhagia or metrorrhagia; eighth, ovarian incapacity from chronic oöphoritis or pelvic peritonitis; and, ninth, non-retention of semen. We do not state this sequence dogmatically, but merely to convey an idea of our impressions with reference to the matter.

FIG. 333.



Vulva of Multipara.

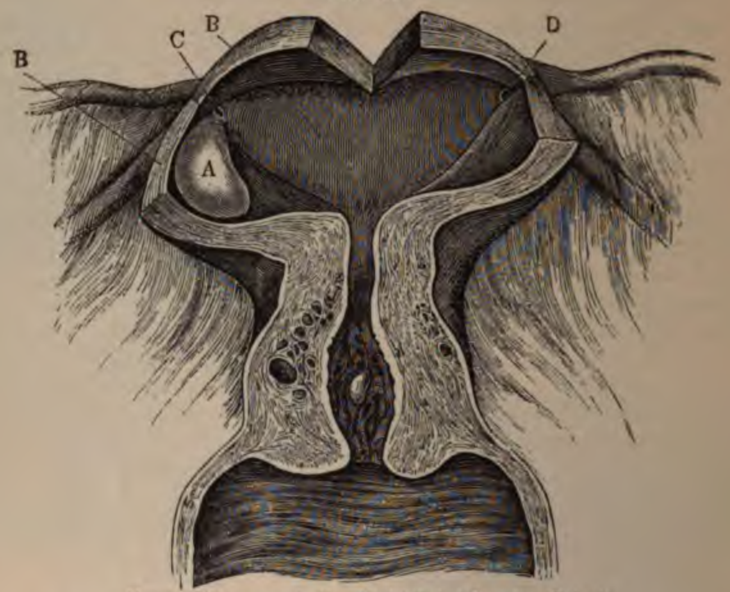
FIG. 334.



Rectocele, with gaping Vaginal Orifice.

Showing possible non-retention of semen as a frequent cause of sterility.

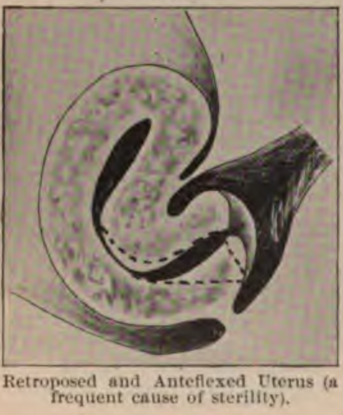
FIG. 335.



Mucous Polypus occluding Right Tubal Opening (Beigel).
B, wall of uterus; C, orifice of right tube; D, orifice of left tube; A, mucous polypus.

Differentiation.—Before it is determined that a woman is sterile the sexual capacity of the husband should be ascertained. Men are averse to the confession of impotence, and will often allow the supposition of sterility on the part of their wives to be maintained rather than admit the truth. In two cases we have used an anæsthetic, ruptured the hymen, and distended the vagina, under the impression that sterility of several years' standing was due to the impossibility of the accomplishment of intercourse, and in two other cases have dilated the uterus, curetted for endometritis, and caused an intra-uterine stem to be worn for a number of months, under the impression that the canal was too narrow and bent for conception; and in all these four cases have subsequently discovered that the husbands of our patients were entirely impotent, and had been so before marriage.

FIG. 336.



Retroposed and Anteflexed Uterus (a frequent cause of sterility).

Gross has found that in about 8 per cent. of all cases of sterility the fault lay with the husband, who might be apparently perfectly potent, with abundant seminal discharge, but whose semen proved under the microscope to be entirely void of spermatozoa or to show only a few feeble or dead ones.

Prognosis.—In reference to a disorder which may be produced by such a variety of causes no positive prognosis can be given, for its cure will entirely depend upon the removal of the agency which produces it. Much, too, will depend upon the thorough investigation of the causes by the physician, and a proper understanding on his part of the treatment. Unquestionably, a large proportion of sterile women may by appropriate treatment be made fruitful.

In this connection it may seem appropriate to make a few remarks on two causes of sterility which we have not thought best to incorporate in the systematic list given on page 787.

We have frequently seen women with no apparent reason for their sterility, so far as an examination of their sexual organs could determine, but who were anæmic, adipose, flabby, phlegmatic, and confessed to an entire absence of sexual desire or gratification. It has seemed to us that in these women there was a constitutional reason for their failure to conceive, and that by increasing the amount of red blood-corpuscles in their blood, by reducing their adipose through the administration of iron, exercise, massage, Turkish baths, and perhaps a course of treatment at Marienbad or some similar resort, their sexual activity would be so stimulated that conception might result; and we have seen too many successful cases after this plan of treatment not to believe that the result was, to a certain extent at least, due to the treatment. Again, we have found a change of air and scenery, such as is produced by a trip abroad, to bring on in some way a change of nutrition and an activity of the sexual organs which resulted in a speedy impregnation.

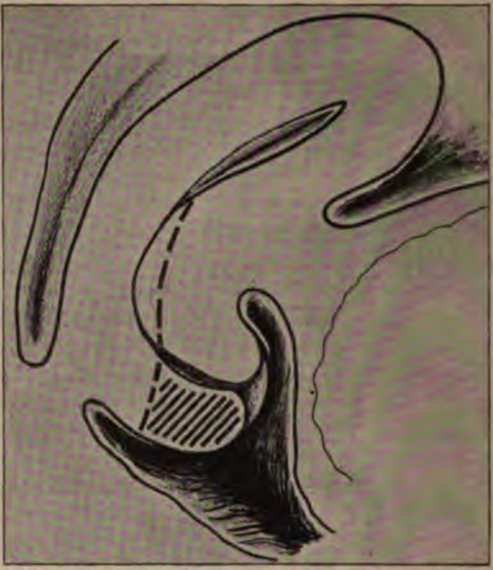
The second cause for sterility, which we advance with some hesitation, is a possible lack of affinity between husband and wife. We do not mean to imply that such affinity, or even affection, must necessarily be present in order to ensure the occurrence of conception, for we know that many women readily conceive who have no special affection for their husbands nor desire for offspring, nor even sexual passion whatever; but it is an undoubted fact that some women will not bear children by certain men, who have had children by other women, and have since been perfectly healthy, whereas in a second marriage conception readily takes place.

Of course, while the treatment of the first-named cause is self-evident and easy to carry out, for the latter we as physicians can do nothing.

The suggestion made and carried out in several instances by Sims, to produce conception artifically by injecting the semen into the uterus —"artificial impregnation"—has been followed by Courty, Pajot, Eustache, Hegar and Kaltenbach, Mundé, and others, but has been so uniformly unsuccessful that it may be said to have been practically abandoned.

Results.—No physical results are produced by sterility, but its existence will frequently depress the spirits and sadden a disposition which under other circumstances would have been cheerful and equable. The married woman has always regarded, and will for ever view, this incapacity as a reproach to her womanhood, and no amount of argument can make her accept it with resignation.

FIG. 337.

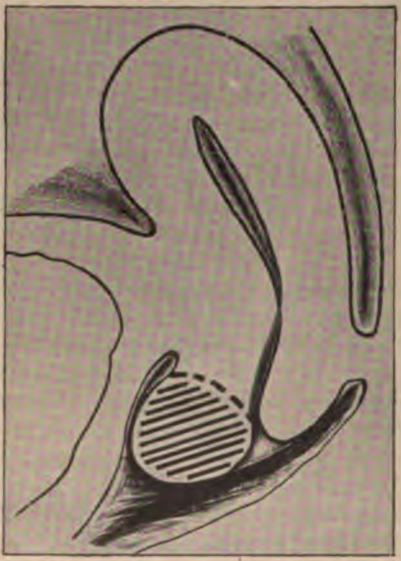


Anteflexion of the Uterus, showing Sims's posterior discission.

Treatment.—The treatment of sterility consists in the removal of its cause. Many of these causes are not susceptible of remedy, while the means of treating others are so evident that special mention may be confined to a few. Obturator hymen, vaginismus, atresia vaginæ, and occlusion of the cervical canal should be treated by the surgical operations appropriate to each.

In case the vaginal cervix should, to only a limited extent, be too projecting or conical, the bilateral operation for its enlargement should be practised after the method elsewhere described. If a slight constriction of the cervical canal appear to be the cause of the condition, dilatation may be essayed in place of a surgical procedure. In an aggravated case, when the neck projects markedly and is decidedly conoidal in shape, both these means are insufficient; amputation then becomes necessary. After this has been recovered from, the bilateral operation for cervical hysterotomy is often ne-

FIG. 338.



Excision of Projecting Lip of Cervix.

cessary before cure is effected. In this connection the chapters upon Cervical Endometritis and Dysmenorrhœa should be referred to. Endometritis should be appropriately treated, and abnormal growths should be dealt with as if sterility did not exist.

If a displacement be discovered and replacement and retention be possible, they should be practised. But if in case of flexion this be impossible, the uterine canal should be rendered as straight as is practicable by the cervical incision recommended by Dr. Sims for dysmenorrhœa. Menorrhagia and metrorrhagia should be treated upon the plan recommended in the chapter upon those subjects, and the patient be advised to keep very quiet and to avoid warm and stimulating beverages during menstrual epochs.

If the conditions seem to warrant the correctness of the inference that sterility is due to the non-retention of the semen, the lacerated perineum should be restored and the rectocele cured by the appropriate operations. In any case, the advice should be given to practise coition with the woman's pelvis elevated by a cushion or pillow, this position to be maintained during the remainder of the night. Coition *a posteriori* has also been recommended in cases where no tangible cause for the sterility could be discovered.

As we have elsewhere stated, glandular endometritis and tortuosities of the uterine neck are among the most frequent of the causes of sterility. The first of these is a disorder which is often incurable, and the surgical operations practised for the latter very commonly fail of result. And so with regard to other conditions resulting in sterility. If at the end of a large experience every one would compare the number of his failures in treating sterility with that of his successes, his results would not be regarded as very satisfactory. Unfortunately, the unsuccessful cases soon sink beneath the mental horizon, while the successful ones stand out prominently, and thus many a practitioner by his evidence unintentionally misleads others and produces disappointment.

In closing this chapter we feel constrained to say that, fully impressed as we are by the mechanical theory of the production of sterility as first ably advanced and described by J. Marion Sims, we would not consider that we are doing our duty by our patients if we fail to give them the benefit of all the means which are at our disposal for the relief of whatever mechanical obstructions we may find; and therefore, no matter how small the number of successes which we may attain by such treatment, we should always advise and practise it, provided it can be carried out without special risk or injury to the patient. One successful result out of a hundred failures will still repay us for our labors, and one grateful woman will to a certain extent compensate for the other ninety-nine, who at all events are no worse off than they were before.

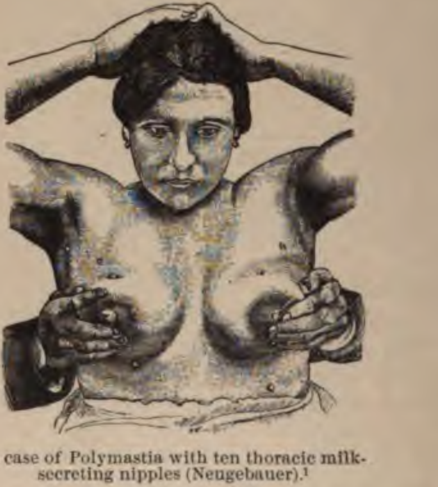
CHAPTER L.

DISEASES OF THE FEMALE MAMMARY GLANDS.

ALTHOUGH it is not customary to treat of the diseases of the female breast in systematic textbooks on the diseases of the female sexual organs, the general surgeon having taken possession of that field, we have thought best to close the revision of this work with a chapter on this subject. The female breast is, after all, a part of the sexual apparatus, and its diseases should be known to and treated by the gynecologist. It is not, however, our intention to go into very minute details on any point, but merely to give a superficial sketch of the malformations and diseases to which the female mamma is liable, referring the reader to the works of Billroth, Gross, and others for a complete description.

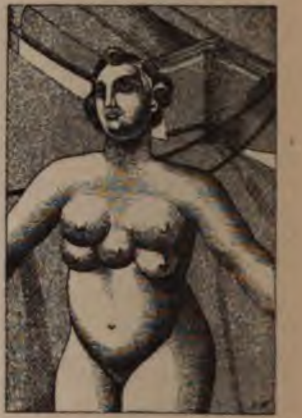
The malformations of the female mamma may be either entire absence, rudimentary or supernumerary development, and absence or retraction of the nipple. The diseases of the breast may be either acute or chronic. Of the acute diseases, the most common is inflammation of the gland, following parturition or puerperal mastitis; fissure or excoriation of the nipple usually precedes the inflammation of the gland itself. Of the chronic affections, tumors of the glands constitute by far the largest proportion. These may be either benign (hypertrophy, fibroma, lipoma, adenoma, cysto-adenoma, and cysts) or malignant (sarcoma, cysto-sarcoma, and carcinoma). We will now proceed to treat of these different varieties separately.

FIG. 339.



A case of Polymastia with ten thoracic milk-secreting nipples (Neugebauer).[1]

FIG. 340.



Case of Polymastia, from the work entitled *Fortunius Licetus de Monstris*, Patavii, 1668. (Taken from La Torre, *op. cit.*)

Absence of the mammary gland in the female (amazia) is of rare occurrence. In one case seen by Louisier it was hereditary; in Froriep's and Schloezer's cases there was likewise congenital absence of the larger portion of the pectoralis muscle.

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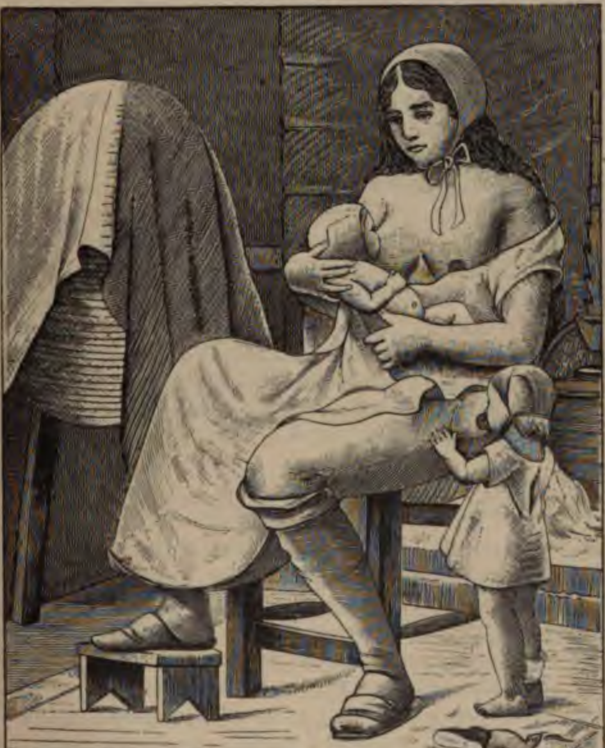
[1] From La Torre, *Il mio primo anuo di Pratico Obstetrico-Gynecologico a Roma*, 1891.

Rudimentary development is more common; indeed, in many women of the present day, unless stimulated by conception, the breasts are poorly developed, and even gradually undergo a certain amount of atrophy. Usually when the breasts are rudimentary the pelvic sexual organs will be found in a similar imperfectly developed condition, the ovaries being either infantile or entirely absent.

Supernumerary mammary glands (polymazia) are by no means so very uncommon, the most frequent form being an additional nipple in the neighborhood of the normal mamma, either below or close to the axilla. The accessory breast is usually much smaller than the normal one, but in nursing-women will be found to secrete milk proportionally quite as freely as the former. A number of observers have reported meeting with four mammæ in one woman (Cooper, Lee, Shannon, Champion, and Gardner). Robert reports the case of a woman whose mother had a double nipple, and she herself had a supernumerary mamma with nipple on the outer surface of the left thigh, from which

FIG. 341.



Robert's Case of Supernumerary Nipple on the Thigh.[1]

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[1] Witkoski, *Histoire des Accouchements*, 188–.

milk was secreted. (See Fig. 341.) It is curious to say that some cases are on record in which supernumerary nipples have been observed in the male sex. Thus Sanderson saw five nipples in a man, two being at the centre of the thorax, two in the axillary spaces, and a median one between umbilicus and sternum.

Obviously, very little can be done for any of the above-mentioned congenital conditions. A supernumerary mamma would be removed only if it became diseased or gave rise to inconvenience of some kind sufficient to warrant operative interference.

Absence or retraction of the nipple is a very common occurrence, and usually attracts attention first when the young expecting mother presents herself to a physician to engage his services in her confinement. The nipple may be found entirely wanting, or it may be so small or even retracted that it is absolutely useless for purposes of lactation. Nothing can be done for these cases when a thorough examination has satisfied the physician that it is impossible to develop the imperfect nipple by gradual pressure or manipulation. In cases where the nipple is capable of erection on manipulation an attempt should be made to force it outward by means of properly-fitted and constantly-worn nipple-shields. The discussion of this subject belongs to obstetrics.

Besides the excoriations and fissures produced by lactation, the nipple and areola are subject to two affections—eczema and a peculiar malignant ulcer first described by Sir James Paget, and called after him "Paget's disease." The diagnosis of both conditions is easy, the malignant type being recognized by its spreading and resistance to treatment and by the pain it causes. Eczema of the nipple should be treated like that disease elsewhere; that is, by zinc, lead, or white precipitate ointments, or by scrubbing with green soap and diachylon plaster. The malignant disease may possibly be cured by the actual cautery or a strong solution of chloride of zinc, but most certainly by complete early excision.

Inflammation of the Breast (Mastitis).

The consideration of acute inflammation of the breast following confinement really does not belong in the present work. We will briefly refer to it merely for completeness' sake, and in order to bring before the profession again a method of treating abscesses of the puerperal breast which has been so successful in our hands that we cannot refrain from once more reporting it. As a rule, inflammation of the puerperal breast is a direct consequence either of transmission of inflammation or of septic infection from a cracked or abraded nipple. More rarely, the pressure of a corset and accidental injury or retention of milk in the deeper acini of the gland, acting as an irritant, will cause such inflammation. The persistence of nursing in cases of injured nipple or of so-called "caked," swollen, and tender breast is often to blame for the progress of the inflammatory process to such a degree that suppuration finally results. An injury, such as a blow or friction of the corset, may excite inflammation and suppuration in a non-puerperal breast. We (P. F. M.) have a case at present under our care of a young girl of seventeen, in whom a bruise received four months ago resulted in an abscess of the left breast, which, treatment in other hands having failed, we hope to cure by the method here described. Besides inflammation and suppuration of the gland itself, the formation of an abscess underneath the gland—that is, between its fascia and the pectoralis major muscle, so-called submammary abscess—is not of very rare occurrence.

Symptoms and Course.—The first symptom of acute inflammation of the gland is usually pain radiating from the nipple in the direction of the affected portion, which is felt to be hard, nodular, and tender. Occasionally the skin is seen to be reddened over the inflamed part. The inflammation may begin with a chill, and usually there is more or less rise of temperature. Unless the process is controlled, it, in a large proportion of cases, goes on to suppuration. The pus, unless evacuated early, burrows its way between the acini and lobes of the gland, and honeycombs the latter as it were, breaking down all the interlobular areolar tissue. If the abscess is not opened, the pus usually will in time find its way toward the surface in one or more places. This process may extend over weeks and even months, one portion after the other of the breast breaking down, and its contents being evacuated through one or more small openings in the skin.

Submammary abscesses differ in this respect, since they usually, being deep-seated, do not open spontaneously, but the pus continues to increase until the intact mamma above the abscess-cavity floats on the subjacent fluid. If the latter is now evacuated by a deep lateral incision, the mamma will at once return to its normal position on the pectoralis major muscle, and all evidences of the presence of an abscess will have disappeared.

The *diagnosis* of a puerperal mastitis is so easy that scarcely a word need be lost on the subject. The presence of pain, fever, swelling, and redness, together with the history, ought to make the case clear at a glance and distinguish the condition from any chronic enlargement or tumor of the organ.

The *prognosis*, so far as restoration to health is concerned, is always good, since but a very infinitesimal proportion of cases of puerperal mastitis terminate fatally; but so far as the saving of the breast for future functional activity or of an arrest of the inflammatory process, no such favorable outlook can be promised. A breast that has once been thoroughly honeycombed by suppuration, in which indeed more or less of the glandular tissue has been destroyed, will probably shrink and atrophy after the suppuration has been arrested, and its functional activity is most likely gone for ever. Hence it must be our object to avoid allowing such extensive destruction of the breast to take place, and this is best done by an early evacuation of the pus and closing of the abscess-cavity in the manner hereafter to be described.

Treatment.—*Acute Stage.*—It must of course be our object to cut short an inflammation of the puerperal breast as rapidly as possible, not only in order to save the mother pain and suffering, as well as to preserve for her the usefulness of the organ, but also for the sake of the child. The methods of ostensibly cutting short an acute mastitis are very numerous, but unfortunately not as successful as numerous.

Some authors claim that the application of ice will always check an acute mastitis, but not every puerperal woman can bear the long-continued application of cold. Others, again, believing that a mastitis always extends through septic infection from fissured nipples, claim that the spread of the infection and resulting inflammation can be prevented and cured by the use of antiseptic lotions to the nipple, chiefly solutions of bichloride of mercury. It is obvious that the free and necessarily somewhat careless use of these poisonous lotions must be fraught with danger to the child, which might easily, if allowed to nurse, get some of the wash into its mouth; the nurse, with a carelessness not entirely unknown to that very useful and necessary class of persons, having forgotten first to wash and dry the nipple. Finally, the largest proportion of physicians believe, with the best show of reason, that the only safe and sure way of preventing the extension of a puerperal mastitis is to immediately withdraw the child from the breast, and exert steady compression by means of systematically and equably applied compresses of cotton and roller bandage to the inflamed organ. Many, indeed, claim that it is necessary to stop nursing, even on the as yet healthy side, because the irritation of the inflamed breast is thereby increased. There can be no question that any case of acute puerperal mastitis can be checked in its early stages by the complete cessation of the function of lactation and the uniform compression of the affected organ. This compression should be continued until all pain and fever has subsided, the bandage not being changed for several days, or if removed immediately replaced. This treatment, be it understood, should, however, never be employed when there is the least sign or suspicion of suppuration. We do not wish to say that every case of fissured nipples or of mild adjacent inflammation must necessarily be treated in this manner, and that cessation of nursing is imperative in every instance. Undoubtedly, the use of solutions of alum in glycerin, sulphate of zinc, tannin, nitrate of lead, compound tincture of benzoin, and of numerous other favorite remedies which we cannot mention here, but of which we should not forget to note nitrate of silver, either in stick or 60-grains-to-the-ounce solution, will frequently heal superficial fissures and erosions of the nipple, and under judicious management of the function of lactation the breast will gradually recover its normal condition. But we feel perfectly safe in maintaining that any well-marked inflammation of one or more of the lobes of the gland will scarcely ever yield to any treatment except to that of rest and the compression above referred to.

If, unfortunately, the inflammation has been allowed to go on to suppuration, or has persisted in doing so in spite of the usual treatment of flaxseed poultices, ointments, gentle expression and rubbing of the breast, in addition to suspension by a cloth tied around the neck, then it becomes the duty of the surgeon to evacuate the pus as soon as its presence and location can be detected.

The incision should be made as carefully as possible, so as not to wound either large blood-vessels or lacteal ducts, and should therefore extend in a radiating direction from the nipple to the circumference of the breast. The pus having been evacuated, the abscess-cavity should be syringed out with a 1 : 10,000 solution of bichloride, and then the method employed which we have found invariably successful, and which we will now describe:

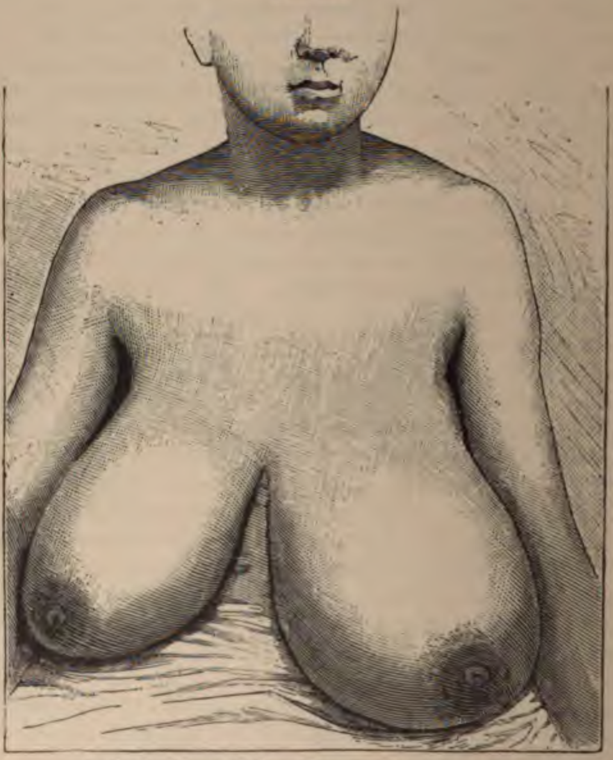
A large, coarse bathing sponge has been procured, thoroughly cleansed of sand and impurities, and soaked in boiling water until it has become perfectly soft. The sponge should be sufficiently large to cover the whole diseased breast, and its centre should be cut out so as to make room for the larger portion of the organ. This sponge is now soaked in a 2 per cent. carbolic-acid solution, the water being as hot as the hands can endure. The sponge is rapidly squeezed, so as to be nearly dry, and is then placed over the breast, so as to leave the opening of the abscess projecting into the centre of the sponge. A piece of oiled silk large enough to cover the sponge is then placed over it, and the latter gently but firmly pressed to the thorax by means of successive turns of a broad roller bandage or by means of two wide three-cornered cloths, one of which passes around the thorax and is tied at one side, and the other upward and under one arm and tied behind the neck. The latter method is the one which we formerly employed, but we think the roller bandage, while a little more troublesome of application, unquestionably more comfortable. The steady compression of the breast by the sponge ensures the non-accumulation of pus in the abscess-cavity, and a consequent approximation of its walls, which, if the sponge is properly applied and the compression of the bandage intelligently exerted, must infallibly result in a closure of the abscess in the course of from four to six days, according to the duration of the abscess and the amount of suppuration. The dressing may have to be removed once or even twice daily, the sponge thoroughly cleansed, and immediately reapplied in the manner described. We have never found it necessary to use more than one bichloride injection into the cavity of the abscess. Usually one daily dressing is sufficient. By this treatment we have cured within one week abscesses which honeycombed the breast in every direction, and which on first being opened exuded not less than six to ten ounces of pus. We have recently succeeded in curing in less than three weeks a case of suppurative puerperal mastitis which had been treated for three months by other surgeons with the old method of daily irrigation and packing with iodoform gauze [P. F. M.]; which latter treatment, although perfectly legitimate in abscesses situated in portions of the body where this system of steady compression cannot be exerted as it can be over the thorax, certainly is entirely out of place and unsuccessful in mammary abscesses. This same species of compression can, we admit, be applied by means of absorbent-cotton compresses covered with a roller bandage or by strips of adhesive plaster; which latter method has been very highly recommended by many eminent authorities, but we claim in favor of the hot wet sponge a compressive power which none of the other agents possess. At times the compressive effect of the sponge must be aided by small wads of absorbent cotton or wound roller bandages so distributed around the edges of the abscess as to compress those portions which escape the action of the sponge. The object is to prevent any accumulation of pus in the cavity of the abscess, and to keep its walls so closely and steadily in apposition that they cannot fail to adhere. If this practice can be properly carried out, it is merely a question of time, and that a short one, for the healing of any abscess.

Submammary abscesses are even easier to cure by this method than those of the gland itself.

Tumors of the Breast.

Benign.—Diffuse Hypertrophy.—This is a very rare affection, but few cases have been seen by even the most experienced observers. Billroth reports two, Winckel one, Cooper, Gross, Erichsen, and some half a dozen others, one case each. Curiously, a number of these cases have been observed in young girls between fourteen and sixteen years of age, in whom the enlargement of the breasts made its appearance soon after the inception of puberty. One of the most remarkable cases as regards size is mentioned in the June (1891) number of the *American Journal of Obstetrics*, the case being reported by Dr. T. G. Crofford of Memphis, Tenn. The girl was fifteen years of age, and the enlargement of the breasts began soon after the first menstruation, early in her fifteenth year. The largest circumference of the breasts

FIG. 342.



Crofford's Case of Diffuse Hypertrophy of the Breasts.

from the front base over the nipple and back to the starting-point was 32½ inches on the right and 35½ on the left side. (See Fig. 342.) The cause of this enormous, mostly very rapid, enlargement of the breasts at this time of life is not known, except that we may infer that the beginning of the sexual period, which usually ushers in a physiological enlargement of the mammary gland, in some cases excites an excessive development. There is only one treatment, and that is removal of the organ. Compression has been tried in vain.

Fibroma of the female breast is not very uncommon. One or more such tumors may be found in the gland at the same time. Their growth is very slow, sometimes extending over a period of years. Billroth mentions one which he had under observation for ten years, without any material change during that time. Usually they are small in size, seldom reaching that of a hen's egg. According to Velpeau, they are found most frequently in unmarried or sterile women.

These true fibroids must not be confounded with nodular enlargements of the breast, which occur very frequently, apparently as the result of reflex engorgement preceding menstruation. We have seen many cases in which immediately preceding the menstrual period one or more such hard, sensitive nodules appeared in one or both breasts. They were undoubtedly merely produced by localized hyperæmia of certain lobules of the breast incident to the approach of the menstrual period, and disappeared after the flow had been properly established. As a rule, such women were sterile and the menstrual flow was scanty in amount. We are inclined to think, however, that true fibroma of the breast may take its inception from a frequent recurrence of such premenstrual congestion.

Fibroma of the breast is not in itself a disease of any special danger or importance, but the rule applies to this form of mammary tumors as well as to all others which are not as yet malignant—namely, that any tumor of the female breast is liable to malignant degeneration at some period of its existence, which period can never be foreseen or prevented. Hence it is wise to treat all such tumors on the general principle to remove them by the knife as soon as their existence is recognized. It is true, unnecessary operations may thus be at times performed, but it is better to perform a dozen unnecessary operations than to postpone a single necessary one until it is too late to effect a permanent cure. These tumors are usually not attended by very much pain, the occurrence of which would generally lead to a suspicion of a change of type of the tumor from a benign to a malignant character.

Lipoma of the female breast is by no means as common as fibroma; indeed, Billroth doubts whether a true fatty degeneration of the tissue of the breast itself occurs, since in the only case which he has witnessed the tumor developed behind the gland, where it grew to an enormous size, pushing the gland before it and causing atrophy of the latter. Sir Astley Cooper and Velpeau each mention a case.

The progress of the disease is slow, and in no way differs from that of lipoma in other portions of the body. It produces discomfort only by its size, and the only treatment is removal.

Adenoma is likewise a rare affection in the female breast. It may occur in two varieties, the solid and the cystic. According to Billroth, the nature of the growth is very similar to that of sarcoma and cysto-sarcoma, into which it may eventually merge. The cases are so rare that no distinct clinical picture can be given of the progress and appearance of the disease. We must refer the reader to Billroth's excellent treatise on "Diseases of the Female Mammary Gland," found in the *Cyclopædia of Obstetrics and Gynecology*, a translation of which was published by William Wood & Co. in 1887, for a more detailed description of this disease.

Cysts containing serum, milk, and a butter- or mortar-like substance are occasionally met with in the female mamma. A few instances of development of the parasite known as the echinococcus or *Cysticercus cellulosæ* in the female breast are on record. The nature of this cyst can be ascertained only by examining the removed fluid under the microscope. Those containing milk result from the dilatation of a milk-duct, the efferent extremity of the duct being occluded in consequence of inflammatory adhesion. This condition is called galactocele. Cysts with the other contents mentioned usually result from a puerperal mastitis.

The *diagnosis* of these cysts is not difficult, but the nature of their contents can be ascertained only by aspiration or exploratory incision. The progress is slow; indeed, they are very apt to remain stationary for a long time, excepting those containing milk, which, if the patient should nurse at the same time, would probably increase in size in consequence of the maintenance of the functional activity of the organ.

The *prognosis* of these cysts is always good, since they show no tendency to malignant degeneration. On the principle, however, already enunciated, that all tumors of the female breast should be removed for fear of their eventually becoming malignant, we would advise the same course in relation to cysts. An exception to this rule should be made in favor of galactocele, the incision and drainage of which would probably result in a cure.

Enchondroma or a cartilaginous degeneration of the mammary tissue is so rare that its occurrence need hardly be mentioned.

Malignant Tumors.

Sarcoma.—Three kinds of solid sarcoma of the breast are usually described—the medullary, the alveolar melano-sarcoma, and the alveolar giant-celled sarcoma. This affection is by no means as common in the breast as the true variety of malignant disease—namely, carcinoma.

The histological peculiarities of these different forms of sarcoma are expressed in a general manner by the names given to the varieties. The soft or medullary sarcoma resembles macroscopically the tissue of the brain; under the microscope many small round cells, some fat tissue, and striated muscular fibres (Billroth) may be recognized. The alveolar melano-sarcoma shows numerous small cells arranged in nests, with brownish-black pigment scattered throughout the growth, and in the alveolar giant-celled variety the cells are large, caudate, and arranged in bundles and nests.

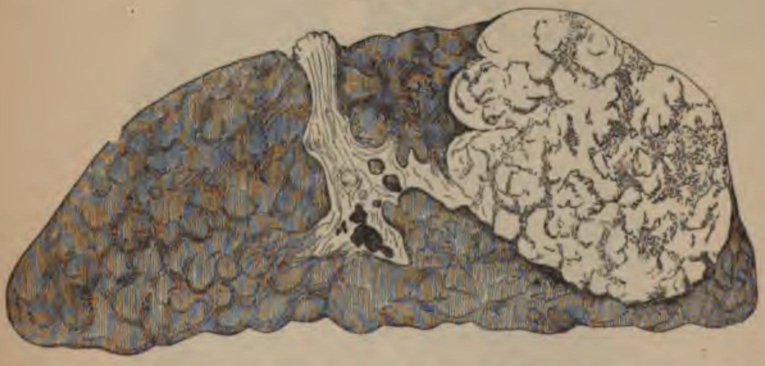
Cysto-sarcoma of the breast is more common than the solid form, Billroth reporting as many as nineteen cases seen by himself. The tumors sometimes attain very great size, one reported by Velpeau weighing forty-four pounds. On account of the tendency of these growths to increase rapidly by a formation of new cysts and the growth of polypoid excrescences in these cysts, the name of "proliferating cysto-sarcoma" is usually given to this disease. These tumors are found most frequently between the twentieth and fortieth years, and are more common in the married and in women who have borne children than in the unmarried. They are always encapsulated and movable in the gland, and vary considerably in the rapidity of their growth. They are usually not painful to light touch. Although not so rapidly fatal as true carcinoma, cysto-sarcoma still eventually causes death by ulceration and breaking down of the tumor and consequent marasmus. Rapid recurrence after removal is reported to be the rule.

Carcinoma.—There is still considerable confusion in the designation of the different varieties of cancer of the female breast, the authorities of different countries calling one and the same form by different names. In order not to confuse the reader, we will quote from Billroth the designations of each variety employed by the German, English, and American schools of medicine:

1. Acinous carcinoma, with partly softer, partly harder nodules (German, Billroth); medullary carcinoma, tuberous form of cancer (English, Birkett); encephaloid, tuberous form of cancer (American, Gross).

2. Carcinomatous infiltration, histologically tubular carcinoma, carcinoma simplex (German, Billroth); intraglandular carcinoma, infiltrated form of cancer (English, Birkett); infiltrated form of cancer (American, Gross).

FIG. 343.



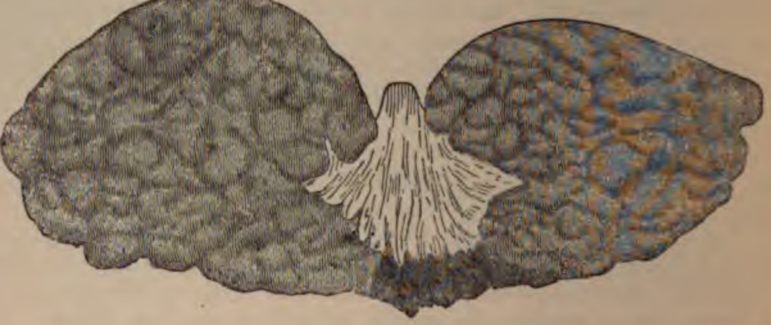
Large Isolated, Soft Carcinoma Nodule (fungus medullaris) on an atrophied mamma, with small involution-cysts; very complete substitution of the mammary by fatty tissue. One-third natural size.

3. Atrophying contracting cancer, scirrhus (German, Billroth); atrophic scirrhus (American, Gross).

4. Colloid cancer, gelatiniform cancer (Gross).

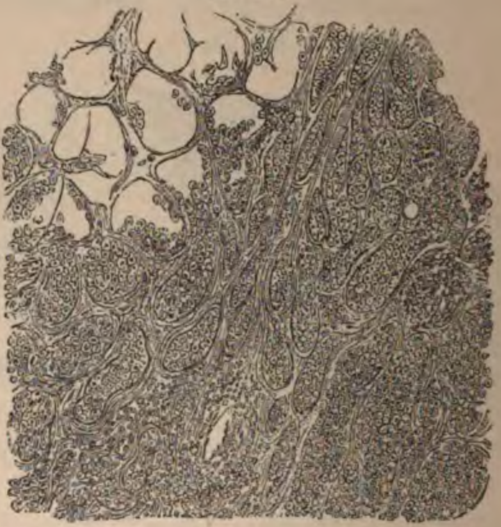
It is not our purpose to enter into the details of the histological characteristics of these different varieties of cancer of the breast; suffice it to say that, according to the greater or lesser predominance of cellular elements or of fibrous tissue the tumor belongs to the soft varieties described under Figs. 339 and 340, or to the hard variety described under Fig. 347. The cancer-cells are scattered without any special regularity throughout the tumor, being separated into greater or lesser nests and columns by bundles of connective tissue. The form designated by Billroth as tubular carcinoma is characterized by the outgrowths of the epithelial mass in the form of elongated ramifying

FIG. 344.



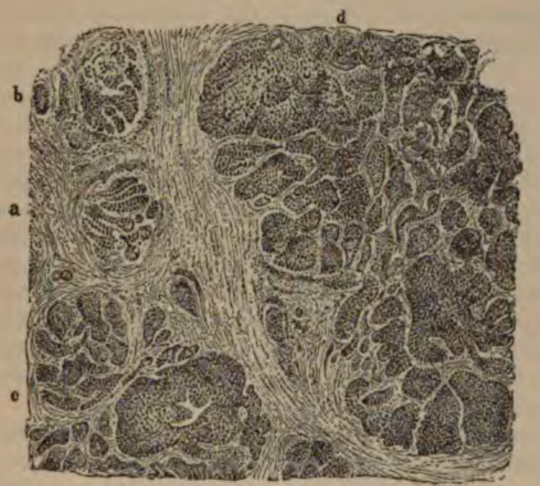
Cicatrizing Mammary Carcinoma, with marked retraction of the nipple; considerable development of fat in place of the mamma. Almost natural size.

FIG. 345.



Typical Picture of a Mammary Carcinoma (Hartnack, Syst. 5).

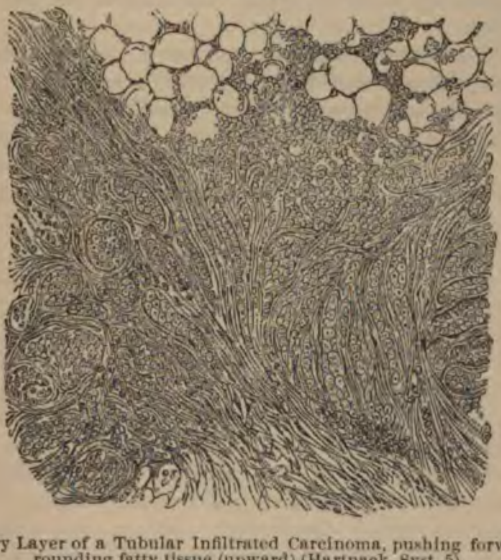
FIG. 346.



om the Limiting Layer of an Acinous Carcinoma of the Mamma (Hartnack, Syst. 2).

ders or filled tubes. (Figs. 343, 344, 345, 346, and 347, taken Billroth, give an idea of the macroscopical and histological appear- of the different varieties of cancer of the breast.)

FIG. 347.



he Boundary Layer of a Tubular Infiltrated Carcinoma, pushing forward into the surrounding fatty tissue (upward) (Hartnack, Syst. 5).

requency and Course of Cancer of the Female Breast.—Unfor- ely, this disease is exceedingly common, being, we believe, even common in the female sex than cancer in that other favorite locality, the cervix uteri. Either breast may be affected, but it is unusual to find carcinoma of both breasts at the same time. The outer side of the breast is most usually the part affected, the infection spreading with more or less rapidity to the axillary and infraclavicular glands. This infection is most likely to take place within from twelve to fifteen months after the beginning of the disease, very often indeed very much earlier. The softer the variety of the cancer, the more rapid and extensive is the infection of the axillary glands. Usually, when these glands have become involved, the pressure upon the axillary nerves causes so much pain that the health of the patient begins to deteriorate, if indeed it has not done so before, in consequence of the softening and breaking down of the tumor, with profuse offensive ichorous discharge. Extension of the cancerous infiltration to the pleura and metastases in the lungs, liver, and other distant organs are liable to occur in the later stages and to hasten the fatal issue. Metastasis even to the bones and brain is reported by Billroth and Von Winiwarter.

The *termination* of cancer of the breast is invariably fatal. We are not aware that there are any cases on record in which spontaneous cure has occurred, either in consequence of sloughing and cicatrization of the breast or spontaneous absorption of the tumor.

Duration of the Disease.—The average duration of life in a woman with carcinoma, dating from the time when the disease was first noticed, is, according to Paget, Sibley, and Winiwarter, between thirty-two and thirty-six months. The same authors give the average duration of life in operated cases as about fifty months—a comparatively slight gain which would scarcely seem to repay the patient for the risk incurred in the operation.

Causes.—These are practically unknown, since in the majority of cases no distinct factor can be discovered upon which the blame for the production of the disease can be positively laid. Heredity does not seem to play a greater rôle in the tendency to cancer of the breast than it can be proved to play in the same disease in any other organ. The fact that cancer of the breast occurs most frequently in married women, especially those who have borne children, would seem to indicate that the irritation produced by lactation has a predisposing influence. Possibly puerperal inflammation of the gland and injuries to the nipple may exert such an influence. Accidental injuries, such as blows, and possibly the steady pressure and friction of the corset, may also be looked upon as instrumental; but usually no positive cause can be ascertained.

Symptoms.—The first symptom which a woman usually notices is the accidental discovery of a small lump in her breast, situated near, generally on the outer side of, the nipple. Occasionally her attention may have been first called to the organ by sharp darting pains through it, when the hard nodule is discovered. In one case which we operated upon (P. F. M.) the first symptom noticed by the patient was the retraction of the nipple, which led her to feel of her breast, when she discovered a hard mass occupying the centre of the gland. Operation proved this to be a well-marked contracting scirrhus. Unfortunately, very often the attention of the patient is not called to the presence of a growth in her breast until the axillary glands have already become involved; which fact accounts for the relatively poor results of extirpation of the diseased tissues, since it is usually impossible to completely remove the carcinomatous axillary glands. The pain in the earlier stages is usually confined to the breast itself, but when the axillary glands once become involved the most severe pain is felt on the inner side of the arm on the affected side, owing to the pressure on the brachial plexus of nerves.

Treatment.—There is probably no one form of disease the cure of which has become so much the province of the charlatan as cancer of the female breast. Innumerable nostrums have been and are still being advertised for this fearful disease, and thousands of women have been tortured by means of caustics and various local applications intended to produce sloughing of the diseased tissues and cicatrization of the wound. It is needless to say that almost without exception all such remedies are useless. Occasionally, after intense suffering, by a mere lucky chance, all the diseased tissue may be destroyed by sloughing and suppuration, and a cure result, but it is, in truth, dearly bought. The only proper treatment and the only means of effecting a sure cure, provided the case comes under observation early enough, before the axillary glands are involved or the disease has spread to the pleura and ribs, is to remove the whole breast—and nothing less than the whole breast will answer—by the knife. The old method of endeavoring to save a portion of the breast, and to remove only that part which appears hard or affected by cancerous infiltration, has been abandoned by the majority of surgeons, and at present the object of the operator is to excise every particle of the mammary gland, whether it appears diseased or not, and to complete the operation by a careful survey of the wound and the removal of every, no matter how minute, particle which appears in the least degree suspicious. The details of the operation need not be described, except to mention that it is of course performed under antiseptic precautions, that the wound is closed by catgut sutures throughout, the drainage-tube being carried from the most dependent portion of the wound out through a slit made in the skin, usually on the side of the thorax. The dressings are of the usual protective and aseptic variety, and are not changed for perhaps a week, unless a rise of temperature should call for an inspection of the wound. Usually, if everything goes well, at the expiration of a week, when the dressings are removed, the wound will be found completely closed, the discharge from the drainage-tube practically absent, and the latter can be removed. The dressing is then reapplied, and when again removed, at the expiration of the second week, the drainage puncture is closed and the patient can be discharged.

Danger of the Operation.—The danger of the operation in itself is comparatively trifling, the removal of the breast alone scarcely ever resulting fatally, while when the axillary glands were involved, according to Billroth, 10.5 per cent. resulted fatally in his practice.

The prospects of permanent cure by the operation depend entirely upon the possibility of removing the whole diseased tissue—therefore

upon the earliest possible performance of the
implication of the axillary glands.

Billroth quotes Weeden Cook as having co
cases of carcinoma of the breast, 409 of which
recurrence for six and a half months, and a later
in 4 other cases. Winiwarter gives 91 cases, wi
per cent. before closure of the wound, in 38.4 per
month, and in 34.1 per cent. later than the fourth
last series the recurrences were so frequent that
first quarter of the year after operation amounte
all cases. Manifestly, the operation was of very l
cases so far advanced as these must have been;
to us whether it is worth while to subject a wom
breast so far progressed that a recurrence is in
months, to the risks and inconveniences of a parti
roth has seen 15 authenticated cases of mammar
there was an absence of recurrence for a period
years, the longest, down to thirteen months, the s
operation. Several cases are reported by Billrot
in which a permanent cure—that is, so long as t
observation—was not achieved until after a seco
operation. Unquestionably, when the cancer is li
gland a complete and permanent cure can be achiev
be expected, if the surgeon is careful to remove t

In order to avoid the mutilation necessarily
cutaneous incision, Thomas has suggested openin
parallel with the sulcus between the lower margin
thoracic skin, and dissecting out the breast from
believe, however, that this method was intended o
tumors, since a mere question of æsthetics would
possibility of an incomplete extirpation.

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